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CHEMICAL EXAMINATION OF THE BERRIES AND BARK OF RHUS GLABRUM.

By William J. Watson.

(An Inaugural Essay, presented to the Philadelphia College of Pharmacy.)

Rhus Glabrum is found in the secondary list of the U. S. Pharmacopœia, and is known by the common names *Smooth Sumach*, *Pennsylvania Sumach*, and *Upland Sumach*.

The fruit of Rhus glabrum, though officinal in our pharmacopœia, is seldom employed by the regular practitioner, but is extensively used by families residing in the country in the form of an infusion, as a pleasant drink in febrile complaints, and as a gargle for sore throat. From the observations of Dr. Fahnestock, it appears that the inner bark of the root is possessed of much higher remedial powers than the fruit; he states that an infusion made from it is almost a specific when employed in the form of a gargle in the sore mouth resulting from mercurial salivation. The Sumach leaves are also used in tanning, and an infusion made from the bark, and concentrated by evaporation, is used as a mordant for dyeing red colors.

The following investigation of the fruit, bark of the root, and galls of sumach, will exhibit their proximate constitution, and may throw some light on their value, as remedial agents.

Professor Rogers in his paper "On the existence of bimalate of lime in sumach berries," which was published in vol. 7, page 56, of the American Journal of Pharmacy, seemed to doubt the presence of uncombined malic acid in the berries; while Mr. Cozzens of New York, supposed the berries to contain the acid in a free state. From the result of the following experiments, both of the gentlemen may have been correct, and the difference in their conclusions may be accounted for, by supposing the specimens examined to have been collected at different times in the season.

Botanical Description.

The Rhus glabrum is an indigenous shrub, belonging to the natural order Anacardiaceæ, and in the sexual system to Pentandria Trigynia. This plant is from four to twelve feet high, with a stem usually more or less bent, and divided into straggling branches, covered with a smooth light-gray or somewhat reddish bark. The leaves are upon smooth petioles, and consist of many pairs of opposite leaflets, with an odd one at the extremity, all of which are lanceolate, acuminate, acutely serrate, glabrous, green on their upper surface, and whitish beneath. In the autumn their color changes to a beautiful red.

The flowers are greenish-red, and disposed in large, erect, terminal, compound thyrses, which are succeeded by clusters of small crimson berries covered with a silky down.

This shrub is found in almost all parts of the United States, growing in old neglected fields, along fences, and on the borders of woods, seeming to prefer hill sides, and the steep banks along rivers, where it grows very luxuriantly, and when the berries are ripe presents a beautiful appearance when seen at a distance.

Analysis of the Bark of the Root.

The bark of the root is of a light gray color, with a tinge of red externally, yellowish white internally, having a very astringent and slightly sweet taste.

The specimen examined was collected in the latter part of April.

A cold infusion was made from the bark, by maceration and displacement, which was of a light brown color, tinged with red, and had the taste and odor of the bark. It gave an acid reaction with litmus paper.

Albumen.—The presence of albumen was evinced in the cold infusion, by solutions of tannin and corrosive sublimate, and also by coagulating with heat.

Tannic Acid.—The muriatic tincture of iron, when added to the cold infusion, produced a bluish-black precipitate; precipitates were also produced, with solutions of gelatine and quiniæ.

Gum.—A cold infusion was made, and deprived of its tannin by adding gelatine in excess, filtered, and boiled to remove the albumen, again filtered, and subacetate of lead added, which produced a precipitate.

Starch.—A decoction was made by boiling a portion of the bark in water, for fifteen minutes, and allowed to cool; to the filtered decoction a few drops of tincture of iodine were added, which produced a precipitate characteristic of starch.

Gallic Acid.—An infusion was made with cold water, and deprived of its tannin by means of gelatine, filtered, and the filtrate evaporated to an extract. This was treated with ether, and when the ethereal solution was allowed to evaporate spontaneously, it yielded crystals of a light yellow color, which, when dissolved in water, gave an acid reaction with litmus paper; and solution of sesquisulphate of iron added to it, caused a greenish black coloration, entirely dissipated by heat.

Caoutchouc.—An alcoholic extract was made, and a portion of it was taken and rubbed up with water, giving a dark and opaque liquid; this was then filtered, and a residue was left on the filter, which had the appearance and consistence of caoutchouc, and was entirely soluble in recently distilled oil of turpentine.

Soft Resin.—The remainder of the alcoholic extract was treated with ether, and the ethereal solution shaken up with water, when a light gray resinous precipitate was thrown down, which was acid to litmus paper, had a soft consistence, and was entirely soluble in solution of caustic potash, with the effect of neutralizing the solution, which would seem to indicate an acid resin.

Volatile Oil.—Water distilled from the bark, had a strong disagreeable odor, and was slightly milky, as if due to the presence of volatile oil.

Coloring Matter.—The bark contains a small portion of brown coloring matter, which is dissolved out by both alcohol and water. It was not isolated.

From the foregoing experiments the bark of the root contains albumen, gum, starch, tannic acid, gallic acid, caoutchouc, soft resin, coloring matter, and probably a volatile odorous principle.

Analysis of the Galls.

Sumach galls are of a reddish brown color externally, grayish white internally, having a very astringent and slightly bitter taste, and vary much in size and appearance, being generally very irregular in their outline, hollow, and sometimes consist of a mere shell, of a line or less in thickness.

The specimen of sumach galls which I examined, was an inferior one, from being collected late in the season, and yielded only six per cent. of tannic acid, about three per cent. of gallic acid, together with albuminous and coloring matter.

Analysis of the Berries.

The appearance of sumach berries is familiar to every druggist, they grow in large clusters, and are generally of a crimson color, and covered with a silky down.

Two specimens of berries were examined, one of which was collected in the latter part of August, and the other late in September. The specimen collected in August was of a deep red color, and slightly acid taste, and the berries were completely covered with the silky down peculiar to them. When examined under the microscope, the silky down appeared to be a mass of tubular hairs of a white color, enveloped in a crystalline coating of bimalate of lime, impregnated with red coloring matter, resembling an icicle in appearance.

The specimen collected in September was of a crimson red color, and very acid taste, and when examined under the microscope the berries were found to be nearly devoid of the peculiar silky down, but were covered with a deep red coating of moist matter, as if due to the presence of a deliquescent salt.

Tannic Acid.—The presence of tannic acid in sumach berries was determined by the following test: the tincture of muriate of iron, produced a bluish black precipitate, when added to the cold infusion. Precipitates were also produced with solutions of gelatine and tartar emetic.

Gallic Acid.—An infusion was made with boiling water, the tannic acid removed by adding gelatine in excess, filtered, and the filtered liquor evaporated to an extract, which was treated with ether, and the ethereal solution allowed to evaporate spontaneously, when it yielded a substance of a light yellow color and slightly crystalline form, which, when dissolved in water, and solution of sesquisulphate of iron added, produced a greenish black coloration entirely dissipated by heat.

Fixed Oil.—One hundred grains of the berries, collected late in August, were bruised, and treated with cold ether by displacement, and the ethereal tincture allowed to evaporate spontane-

ously, yielding a residue weighing thirty grains, which was shaken up with water to remove the tannic and gallic acids, and allowed to stand for a short time, when an oily matter was found floating on the water. This, when separated, weighed fifteen grains. It was found to be a fixed oil, by giving a greasy stain to paper, which did not disappear by heating; it also burnt with a smoky flame, and was saponified by potash. It was miscible in all proportions with chloroform, and but slightly soluble in alcohol. It is probable that the oil exists in the kernels of the seed, as it cannot be obtained but in very small quantity from the unbruised berries.

Malic Acid and Bimalate of Lime.—The quantity of free malic acid in the berries was estimated by making a tincture with cold alcohol (bimalate of lime being insoluble in cold alcohol) and evaporating carefully to dryness, dissolving the alcoholic extract in water and adding acetate of lead to this, so as to obtain the malic acid as malate of lead. The malate of lead was afterwards decomposed by means of sulphuretted hydrogen, by which the malic acid was liberated, and it was isolated by filtering and evaporating the solution carefully to dryness. The quantity of bimalate of lime present was estimated, by burning the aqueous extract obtained from a given amount of the berries, treating the ashes with an excess of nitric acid, filtering, and precipitating the filtered liquor, with oxalate of ammonia in excess, so as to obtain the lime present as oxalate.

Bimalate of lime readily crystallizes from a concentrated aqueous solution of the berries, the size of the crystals depending upon the mode of evaporation, being much larger if evaporated spontaneously.

Two specimens of berries collected at different times were analyzed. The first collected in the latter part of August, yielded 7.46 per cent of bimalate of lime, and 0.50 per cent of free malic acid. The second specimen, collected late in September, yielded 3.50 per cent. of bimalate of lime, and 2.75 per cent. of uncombined malic acid.

Which proves that berries collected at different times in the season, vary much in the quantity of malic acid and bimalate of lime which they contain.

Red Coloring Matter.—A portion of the berries were treated

with alcohol, and the alcoholic tincture evaporated to an extract, and then treated with ether to remove the tannic and gallic acids, and any oily matter that might be present. The extract was then dissolved in water, and solution of ammonia added gradually, until the malic acid present was accurately saturated, which had the effect of changing the red color to blue; when the alkali was added in excess it became green, and when allowed to stand in contact with an excess of the alkali, the coloring matter was decomposed, changing to a reddish brown. The true coloring matter of sumach berries is therefore blue, which is changed to red by the action of the free malic acid present.

Extractive Matter.—A strong infusion was made with boiling water, and the bimalate of lime crystallized out by spontaneous evaporation; the concentrated infusion was then filtered and shaken up with ether, to remove the tannic and gallic acids, the ether was separated, and the aqueous solution evaporated to an extract, and treated with alcohol to remove the coloring matter and malic acid, and a dark brown residue was left of extractive matter, having a slightly bitter taste.

Gum Albumen and Starch.—The presence of neither of the foregoing principles could be detected when the usual tests were applied.

Volatile Oil.—Half a pound of the bruised berries were treated by distillation with water till a pint of distillate was obtained, which was returned to the still with another similar portion of berries, and a little more water, and again a pint distilled.

The distillate was somewhat milky, and strongly charged with a peculiar, unpleasant odor, probably due to volatile oil.

From the foregoing experiment with sumach berries they contain tannic acid, gallic acid, fixed oil, free malic acid, bimalate of lime, red coloring matter, extractive matter, and probably volatile oil.

Philadelphia, January 29th, 1853.

ON SYRUP OF IODIDE OF IRON AND MANGANESE.

By William Procter, Jr.

The attention of the medical profession has recently been awakened to the advantages to be derived from the use of the

salts of iron and manganese in combination, when preparations of iron alone have heretofore been indicated. Among the compounds used by M. Petrequin, is a syrup of iodide of iron and manganese, but the method suggested for its preparation from the solid iodides, by M. Burin-Dubuisson is too indefinite to be generally adopted, besides involving the necessity of previously preparing and keeping the solid iodides. The following formula yields a preparation of the strength of the officinal syrupy solution of iodide of iron, and the manner of using it, and the doses are the same.

Take of Iodide of Potassium, . . .	1000	grains.
Proto-sulphate of iron, (in crystals,)	630	"
Proto-sulphate of manganese, " .	210	"
Iron filings, (free from rust,) . .	100	"
White sugar, (in coarse powder,) .	4800	"
Distilled or boiled water, a sufficient quantity.		

Triturate the sulphates and the iodide separately to powder, mix them with the iron filings, add half a fluid ounce of distilled water, and triturate to a uniform paste. After standing a few minutes, again add half a fluid ounce of distilled water, triturate and allow it to rest fifteen minutes. A third addition of water should now be made and mixed. The sugar should then be introduced into a bottle capable of holding a little more than twelve fluid ounces, and a small funnel, prepared with a moistened filter, inserted into its mouth. The magma of salts should then be carefully removed from the mortar to the filter, and when the dense solution has drained through, distilled or boiled water shouldbe carefully poured on in small portions, until the solution of the iodides is displaced and washed from the magma of crystals of sulphate of potash. Finally, finish the measure of twelve ounces, by adding boiled water, and agitate the bottle until the sugar is dissolved. The solution of the sugar may be facilitated, when desirable, by standing the bottle in warm water for a time, and then agitating.

Each fluid ounce of this syrup contains fifty grains of the mixed anhydrous iodides in the proportion of three parts of iodide of iron to one part of iodide of manganese, and the dose is from ten drops to half a fluid drachm.

Remarks.—Owing to the slight solubility of the resulting sulphate of potash, and the small quantity of water employed to effect the interchange of elements, but little of that salt is contained in the syrup. The object of the iron filings is to saturate any free iodine that may be eliminated during the exposure consequent on the gradual reaction of the salts. The use of either distilled, or cold recently boiled, water, is necessary to obviate the effect of air on the iodides. It is necessary to allow sufficient time for the complete decomposition of the sulphate of iron, else the syrup will be contaminated with it. The proper moment to lixiviate the sulphate is known by the cessation of the crystallization of the sulphate of potash. The bottle should be shaken from time to time during the filtration to protect the filtered solution, and the washing process should be stopped as soon as the sulphate ceases to have a well-marked taste of the iodides. Practically in this, as in all cases where syrups are made by agitation, and are not to be filtered, it is best to use pure lump sugar, and coarsely powder it for the occasion, as the commercial powdered sugar frequently contains dusty impurities. The preparation when finished has a very pale straw color; if the salts have not been all decomposed before the washing, the syrup will have a greenish color, and subsequently deposit crystals of sulphate of potash by standing.

ON THE NATURE OF THE STEAROPTENE OF OIL OF MONARDA PUNCTATA, AND ON THE PRODUCTION OF OXALIC ACID FROM IT BY THE ACTION OF NITRIC ACID.

By Charles T. Bonsall.

(*An Inaugural Essay, presented to the Philadelphia College of Pharmacy.*)

When the essential oil of Monarda punctata is exposed to a temperature of about 40° F., in the presence of moisture, it is transformed into a stearoptene, which has received from Mr. Procter the appellation of monardin,—a name that ought scarcely to be applied, as it would seem to indicate that it was the active ingredient of the oil, while it is in its nature a true camphor. This substance separated from the oil, and distilled over dry chloride of calcium, crystallizes in large oblique rhom-

bic prisms, composed of transparent plates. It melts at 118° F. and boils at 426° F., after which the temperature may gradually be reduced to 82° F., when it solidifies upon slight agitation. When a small portion of eleoptene is present, the temperature may be reduced much lower before crystallization takes place. According to the analysis of M. Arrpe, monarda camphor (a name which is more applicable to this stearoptene,) is composed of C_{10} H_7 O, being, as he infers, an oxide of a compound radical C_{10} H_7; three equivalents of which radical, together with an equivalent of oxygen, he supposes to be the constitution of the eleoptene; a formula which makes it isomeric with camphrone. By the addition of two equivalents of oxygen to the eleoptene, there will be formed three equivalents of the stearoptene. This may explain the complete transformation of the oil into the camphor product.

That this solid substance is formed by the absorption of oxygen we may prove experimentally. If a fresh and unexposed specimen of the oil be deprived of moisture, which is present in the distilled oils, and exposed to a low temperature in an atmosphere of its own vapor, it solidifies, but resumes its fluidity at ordinary temperatures. Oil of monarda exposed to the air or to oxygen at 32° F. soon begins to deposit the stearoptene, which is accelerated by the presence of moisture. It does not appear that it absorbs the water, as when a portion has been kept over that fluid in a graduated tube so contrived that it was supplied with dry air, a large portion of the camphor was deposited, but the water remained the same in quantity.

When either the oil or stearoptene is treated with strong nitric acid, it is converted into a resinous matter. This resin maintained at a boiling temperature, and treated with portions of nitric acid until dissolved, is wholly transformed into oxalic acid. When we come to examine the products of decomposition, we find that the proportion of carbon in the ultimate product is much less than in the oil which was used. From the percentage of oxalic acid obtained, we may infer that an equivalent of the oil is converted into two equivalents of oxalic acid, six equivalents of carbonic acid, and seven equivalents of water, with oxygen derived from the nitric acid, thus: C_{10} H_7 O+O_{17} = 2C_2 O_3+ 6CO_2+7HO.

In its character the stearoptene partakes of the nature of true camphor. Both are formed by the addition of oxygen to a carbo-hydrogen radical. The formula of the oily base of camphor is C_{20} H_{16}. With O_2 it forms camphor C_{20} H_{16}, $O_2 = 2C_{10}$ H_8, O; while oil of monarda is a tribasic oxide of the radical C_{10} H_7, which by the absorption of O_2 is wholly converted into three equivalents of monarda camphor, thus: $3C_{10}$ H_7, $O + O_2 =$ $3C_{10}$ H_7 O, a formula differing from that of camphor in containing two equivalents less of hydrogen.

If to monarda camphor we could add two equivalents more of oxygen, we should have the formula of anhydrous camphoric acid, C_{10} H_7 O_3. But when we attempt to oxidize monarda camphor, the oxygen displaces a part of its hydrogen, forming water, and converts it into a resinous matter, which, as I have said before, upon being further treated with nitric acid, is transformed into oxalic and carbonic acids and water. The formation of oxalic acid in this case is of some interest, as essential oils, and particularly those of a terebinthinate nature, are converted by nitric acid into resins, peculiar acids and carbonaceous products, but yield no oxalic acid.

Philadelphia, Jan. 13th, 1853.

EMPLASTRUM EXTRACTI ACONITI RADICIS.

By Wilian Procter, Jr.

Having been requested by Dr. Francis Gurney Smith to prepare a plaster medicated with *aconitia*, the following formula was suggested by me as being less expensive than one requiring the pure alkaloid, yet possessed of equal, if not superior efficiency, because the greater bulk of the extract would prevent the plaster from masking the power of the active ingredient, and its ready solubility more favorable to the influence of the remedy.

Take of Aconite root, in coarse powder, four ounces.
" Alcohol, sp. gr. 835, a sufficient quantity.
" Adhesive plaster, three ounces and a half.

Moisten the powdered aconite root with six ounces of alcohol, and permit it to macerate twenty-four hours, then put it in a small displacer, and when properly packed, pour on gradually sufficient

alcohol to make a pint of tincture. Distil off three-fourths of the alcohol, evaporate the residue on a water-bath to a thick, syrupy consistence, then add the plaster previously liquefied, and stir constantly, until it is properly incorporated with the soft resinous extract, and cools. The resulting aconite plaster has a brown color, and homogeneous consistence, and weighs about four ounces troy. This plaster should be spread in a thin stratum on skin or oiled silk, and may be used several times when its application has not been too long continued at first.

Dr. Smith has employed this plaster in several cases of neuralgia, especially about the head, and has obtained from it the well-marked effects of aconite; in some instances so decided as to require the removal of the plaster for a time. He has also used it in painful tumors of the breast with much satisfaction.

ON THE PREPARATION OF CHLORIDE OF ZINC.

By Benjamin J. Crew.

Having been recently engaged in the manufacture of chloride of zinc in considerable quantities, and not being satisfied with the product when prepared strictly in accordance with the formula of our Pharmacopœia, I adopted a somewhat different method, and meeting with entire success, I have thrown together a few remarks which may perhaps be useful to others who have experienced the same difficulties. In the officinal formula the quantity of hydrochloric acid requisite to dissolve the given quantity of metallic zinc, is with propriety omitted on account of the variable strength of commercial acid. Any convenient quantity of zinc may be used, and requires between three and four times its weight of acid to completely dissolve it; or any convenient bulk of acid may be employed, and zinc added until effervescence ceases: either plan may be used without difference of result. Having obtained a neutral solution, it is filtered or strained, to separate the black sulphuret of zinc which has been formed. I then add the requisite proportion of nitric acid to oxidize any iron which exists in the commercial muriatic acid. The solution, upon the addition of the acid, assumes a dark brown color, which is dissipated by heat, leaving an orange hue.

I then add the precipitated chalk, as being purer and therefore preferable to ordinary prepared chalk, and proceed to evaporate to dryness, during which any iron that may be present separates as oxyde. The impure chloride is then dissolved in distilled or pure filtered water, and again filtered, and again evaporated. This last operation requires close and careful watching. The evaporation is continued longer than is generally thought necessary. With a very gentle heat, the directions given by the Pharmacopœia to evaporate to dryness, may be complied with, but owing to the exceedingly deliquescent nature of this salt, I think this an ineligible form; for if the bottle containing the chloride in a pulverulent form be left open even for a short time, it speedily forms a coherent mass, and becomes inconvenient for use. I therefore continue the evaporation over a brisk fire until what may be called the first stage of evaporation is completed, which may be known by dipping into the melted mass a glass rod. If complete, a white opaque pellicle immediately forms upon the rod, as soon as withdrawn. This may with propriety be called the aqueous fusion, and the salt may be poured on a marble slab. It chills very quickly, and becomes solid; but as this did not possess the requisite hardness and fineness, the heat was continued upon another portion, until it fairly passed into the igneous fusion, the frothing ceased, and the melted liquid became beautifully clear and of a high sp. gr., as a bit of broken glass readily floated on the surface. It may now be poured on a marble slab as before, and, when cool, broken to pieces and kept in well stopped vials secured by wax. As thus prepared, it is beautifully white and hard, though equally as deliquescent as when prepared in any other way, yet presents less surface to the action of the moisture of the air.

Before closing this paper, I wish to make a few remarks upon the crystalline nature of this salt, as I do not remember having met with any previous notice of it. At or about the time it begins to pass into the aqueous fusion, if a strip of glass be dipped into the solution and carefully watched as it begins slowly to solidify, the crystallization of this chloride may be readily seen. At first only a point or nucleus; it then steadily increases in size, when the real form of the crystal may be discerned,—acicular and radiant from one centre. This is conducted with

such perfect regularity, that the integrity of the circumference is completely preserved. By this time the whole surface of the glass is covered with these perfect and beautiful discs, gradually coalescing and forming one mass. These crystals, however, can be preserved only for a few moments, perhaps half a minute, as they speedily deliquesce and disappear. In one instance the vessel containing the solution was allowed to remain over the fire, which was nearly extinguished, over night, giving, of course, a good opportunity for the whole to cool very gradually. Upon examination next morning, it was found to be one mass of crystals, which upon application of heat were readily dissolved, and the operation completed as before described.

Philadelphia, 4th mo. 6th, 1853.

INFUSUM JUNIPERI COMPOSITUM.

By the Editor.

Having had occasion to prepare a variety of diuretics, for a member of my family affected with valvular disease, attended by dropsical effusion into the pleura and pericardium, none of them proved so successful as the infusion of Juniper berries with cream of tartar. The necessity of making the infusion every day, led to the adoption of the following formula, which was afterwards used with much satisfaction.

Take of Juniper berries, thoroughly bruised, four ounces.
Holland gin, - - - four fluid ounces.
Boiling water, - - - twelve fluid ounces.

Pour the boiling water over the bruised juniper, add the gin, mix them and let them macérate for twelve hours. The whole should then be thrown on a cotton cloth and expressed, and sufficient water added to the dregs and pressed out to make the infusion measure a pint.

The preparation thus made has an opaque brown color, and a decided odor and taste of the berries. When desirable, it may be made more active by rubbing one drachm of the oil of juniper with the bruised berries, then pouring the gin upon them, and after macerating an hour, adding the boiling water, and continuing the maceration for eight or ten hours longer. The liquid is then sepa-

rated by expression as above. When made by the last method, the infusion contains more of the oleo-resin of juniper in suspension, and is much less agreeable to the taste, but is more active and efficient. When the patient is troubled with gastric irritability, the first infusion is more appropriate. Whichever may be employed, the dose is from a tablespoonful to a wine glassful, mixed with a teaspoonful or more of cream of tartar, three times a day regularly. It is much better in prescribing juniper berries and cream of tartar for a patient, to direct the salt to be kept separate from the berries, and administered by measured doses with the infusion after it is made; because, when they are infused together, a large portion of the bitartrate crystallizes among the juniper dregs as the infusion cools, and is lost by straining the infusion.

PHARMACEUTICAL NOTICES.

By Alfred B. Taylor.

Fluid Extract of Serpentaria.

Being desired by a Physician to make a strong Tincture of Serpentaria, a fluid extract was naturally suggested. The following form was used, and was found to afford a preparation containing all the virtues of the root in a very concentrated state:

Take of Serpentaria, bruised, ℥xii.

Alcohol and water, each a sufficient quantity.

Mix the serpentaria with 12 oz. alcohol, and allow it to stand for twenty-four hours; then transfer it to a percolator and pour alcohol gradually upon it until a pint and a half of filtered liquor is obtained. Place this in an evaporating dish and allow it to evaporate spontaneously until reduced to six fluid ounces. To the root, exhausted by alcohol, add water, and displace till it is exhausted, or until about three pints have passed; evaporate this portion in a water-bath to six fluid ounces, mix the two parts together and filter. Each ounce of this represents one ounce of the root—consequently, the dose of the root being from 10 to 30 grs., (and there being from 85 to 90 drops in a fluid drachm of this extract,) the dose would be from 15 to 45 drops.

* [Note.—For a preparation analogous to the above, of half the strength, preserved by means of sugar, and suggested by Mr. John C. Savery, the reader is referred to vol. 23, page 119 of this Journal.—Editor.]

Having been called upon frequently by Apothecaries and others for the formulæ of the following preparations, (which, I believe, have not as yet appeared in print,) it was thought that their publication would be acceptable to the readers of the Journal—as they have been very extensively prescribed and used, both in this city and elsewhere. They are the prescriptions of Dr. John K. Mitchell, Professor in the Jefferson Medical College of this city:

℞. Pulv. Rhei, ℥ij.
" Aloes Socot: ℥j.
Hydrarg: Chlorid: Mite, ʒj.
Ant: et Potassæ Tart: ʒ½.
Pulv:
Sig: Aperient Powder.

Take of Aperient Powder, ʒij.
Powdered Soap, ℈ij.
Mix with water, and make into a mass, to be divided into 40 pills.
Sig: Mitchell's Aperient Pills.

℞. Ext. Quassiæ, ʒij.
Ext. Conii, gr. x.
Ferri Carb: gr. x.
Liq. Potass: Arsenitis, gtt. x.
Mix and divide into 40 pills.
Sig: Mitchell's Tonic Pills.

LETTER RELATING TO THE SALE OF POISONS IN VERMONT.

[The following letter, elicited by our request for information on the subject of poisons, etc., though not intended for publication, we have thought best to publish as an encouragement to pharmaceutists in other localities, to assist the Committee in carrying out the objects of its appointment. A little time devoted in this way by our distant brethren will be duly appreciated.—Editor Amer. Journ. Pharm.]

Bennington, Vt., March 18, 1853.

W. Procter, Jr., Esq.
Chairman of Committee on Poisons, &c.

Dear Sir.—In the Journal of Pharmacy, March number, I notice a call for information on the subject of the "sale of poisons."

Being the principal Druggist in this part of Vermont, and feeling a lively interest in all matters pertaining to the profession of pharmacy, I take this opportunity to present a few remarks in connection with the subjects under inquiry.

1st. You ask "whether any State or municipal laws exist regulating the sale of poisons?" I answer that *no* law exists in the State of Vermont, either *regulating* or *restricting* the *sale of poisons*. Indeeed, the terms *sale of poisons*, *selling poisons*, &c., do not exist in the compiled statutes of Vermont.

2d. "If not, does any voluntary conservative action have place among druggists and apothecaries, and if so, how far?" The legitimate drug establishments of the State are few; the proprietors of those few establishments, however, sell no poisons without properly marking them as such. Indeed, I am credibly informed, no article leaves their shops without its appropriate mark or label. Of my own mode of dispensing poisons, &c., I will speak hereafter.

3d. "To what extent do grocers and general shopkeepers retail arsenic and other poisons used for destroying animal life?" In most of the larger towns of this State general shopkeepers are found who dabble in drugs and medicines, and in the small towns you find little stores, in which drugs, &c., are mixed up with all sorts of merchandize. At all of these shops you can buy arsenic, opium, and at many of them *strychnia* can be obtained. Poisons are not marked at all by these general dealers, and it is really surprising that so few accidents occur from such gross carelessness.

Having thus briefly answered your questions, permit me to present my own method of dispensing poisons and medicines generally.

1st. In dispensing poisons, I have made it an invariable regulation, to enclose the article within three wrappers, the outside wrapper being properly marked to designate the contents of the package. Of the active mineral poisons, arsenic is much the more frequently called for by the common people. I have a book which I call *Arsenic Sales Book*, in which I register the date of sale, name of buyer, quantity sold, amount received in payment, with a column for remarks. The other active mineral poisons are but seldom called for by the common people, yet, if sold, they are also marked properly. Of the vegetable poisons, *opium* is the only one called for to any extent, and I sell this drug in a much greater

quantity than it ought to be sold in a small community. I always mark it poison.

2d. In dispensing medicines in general, no article is allowed to go from my shop without its appropriate mark or label.

I opened a drug-shop in this place December 1st, 1843, and in the effort to obtain pure drugs and medicines, I have been materially assisted and encouraged by the entire medical profession of this county. * * * * * * * *

At the date given above, the distinguishing feature of physicians might safely be said to have consisted in their capacious "saddle-bags." Each member of the profession found this half-grown apothecary shop just as essential in his village practice, as for out-of-town business.

Their prejudices, naturally enough, were strongly in favor of the familiar saddle-bag; consequently, not a single prescription was sent to me the first year, (1844,) and less than fifty the second, (1845,) notwithstanding four physicians resided within a "stone's throw" of my shop, and in a village containing some 1500 souls.

I now adopted the following simple method to relieve the physician of his *old friend*, the saddle-bag. By the aid of the printer, I obtained a quantity of prescription blanks, had them bound in books of fifty each, and presented them to the physicians, with the request that they would use them freely, and to direct their patients to get them compounded at the most convenient shops, at the same time assuring them, that such as came to my establishment would be carefully compounded. The idea pleased them. The saddle-bag is not now used. The pocket-case has taken its place, and all express themselves highly pleased with the idea. I copy all prescriptions in a book, and paste the original in another book, and all are numbered to correspond with the package leaving the shop. * * * * * * * * *

Pardon the encroachment on your time, while I remain, very truly,

Yours &c.

S. P. Peck.

BOTANY IN ITS RELATIONS TO PHARMACEUTISTS.

Mr. Wm. Procter, Jr:

Dear Sir,—The season of flowers is rapidly approaching, and the idea of suggesting to your junior readers the advantages they may derive by devoting a part of their leisure time to the study of Botany, has presented itself with so much force, that I am constrained to avail myself of your pages. It is lamentable to what an extent this important branch of science, in its bearing on pharmacy and materia medica, is neglected, not only by pharmaceutists in business, but by students of pharmacy and of medicine. No stronger evidence of the truth of this need be obtained, than the general ignorance manifested by druggists and drug-clerks when you present living or dead specimens of plants to them for recognition. They are ignorant of the mere contour of many of the more important indigenous medical plants, not to speak of their structural characters and habits. One cause of this ignorance is, the fact that most of the medical plants cultivated or collected for use in the United States, are derived from the Shakers, (or those who prepare them similarly,) who completely destroy the configuration of the plants by section and pressure for convenience of packing, and thus prevent them from being recognized. It should be part of the education of a pharmaceutist to study indigenous plants in their native localities, or in the gardens, and not merely their general appearance, but critically as regards structure development, botanical affinities and classification. One of the most beautiful points of systematic botany is the parallel relation that exists between the natural affinities of plants and their chemical constitution, and consequent medical qualities.

Many years ago, it was common for druggists and apothecaries to collect plants, or have them collected and dried under their own superintendence, which is yet done to some extent by a few. This plan affords a good opportunity to apprentices to become familiar with a limited range of plants, and is a part of practical pharmacy that is sadly overlooked.

The pleasure of a ramble in the woods and fields is much enhanced by making it subsidiary to the pursuit of botanical knowledge; although to some it may at first *appear* tedious, a little perseverance will give such an insight of the hidden beauties of

the subject, that its study becomes an intense and self-supporting pleasure. Provided with a book-shaped tin box, (or in lieu of this, a yard of oiled silk and a sheet of paper,) a lens and a strong knife, the student, if a city resident, may quickly be wafted within walking distance of excellent botanical localities, by the omnibuses, cars or ferry boats, and after spending an afternoon pleasantly in recognizing and collecting plants, will return invigorated in health, and loaded with specimens that will occupy the leisure of several subsequent days in their analysis and preservation. This practical knowledge is of lasting service in the conducting of business. With Gray's, Eaton's, or Mrs. Lincoln's Botany at his disposal, all the important indigenous plants may be recognized, and once well learned are never forgotten. It is gratifying to notice that some attention is granted to this science in the curriculum of the Philadelphia and New York schools of Pharmacy; but until the study is accompanied with practice in the manner mentioned, it will be difficult to excite more than a passing interest in the lecture room. Trusting that this intrusion on your pages may incidentally benefit some of your readers, I sign myself, with respect,

A PHARMACEUTIST.

PHARMACEUTICAL GLEANINGS FROM VARIOUS SOURCES.

Anisated Balsam Sulphur.—M. E. ROBIQUET recommends that this preparation should be made by heating one part of sulphur in a flask to about 400° F. until it assumes the ductile condition, when it is suddenly cooled. Four parts of oil of aniseed is now added, the flask imperfectly corked, and the two digested together in a water bath (boiling) for half an hour. After removal from the bath it is suffered to settle for 24 hours, and when perfectly limpid decant it. Thus prepared the preparation contains 8 per cent. of sulphur, which is one-seventh more than that made by the old formula, which is due to presenting the sulphur in the modified or ductile state.—*Journ. de Pharm.*

Hydro-alcoholic Extract of Ergot. By M. STICKEL.—Displace ergot in powder with its weight of ether to remove the oil, dry the residue, and digest it in six times its weight of water during two days at about 167° F. The aqueous infusion is now decanted

evaporated to one-fourth, and, when cold, treated with alcohol as long as that liquid causes a precipitate. The liquid is now filtered and evaporated to the consistence of honey, and set aside. The residue of the ergot is then mixed with its original weight of alcohol, digested during three days, expressed and filtered. The liquid thus obtained is mixed with the syrupy aqueous liquid and evaporated to the consistence of a thick extract. The product amounts to about 21 per cent. of the weight of the ergot, and, according to M. Stickel, possesses advantages over any of the preparations heretofore recommended, embracing as it does all the active products isolated in the processes of Wiggers, Bonjean, Hazer and Ebers.—*Journal de Chem. Méd.*

Hydro-alcoholic Extract of Matico.—Treat powdered matico with a mixture of three parts of alcohol 835° and two parts of water, by maceration and displacement, evaporate the tincture carefully on a water-bath to the consistence of an extract. This extract has a black color, a bitter taste, and a decided odor of the plant. It is employed in the form of pills and to make a syrup.—*Ibid.*

Liquid to Preserve Dead Bodies.—M. Suquet recommends the following liquid as an injection for preserving bodies from decomposition. Take a solution of carbonate of soda, sp. gr. 20° to 22° Baumé, pass into this liquid a current of sulphurous acid obtained by heating a mixture of sulphuric acid and saw dust, until all the carbonic acid is displaced and the sulphurous acid is in excess, when the solution should have the sp. gr. 24° B. It is then poured into a tub containing zinc filings, and allowed to remain until it becomes neutral, which is known by its not effecting polished steel when, after being dipped in it, it is exposed to the air.

A gallon to a gallon and a half of this liquid is necessary for one body, which should be thrown in by one of the carotid arteries. —*Ibid*, Dec. 1852.

Fly Poison without Arsenic.—The following preparation is much used in Switzerland for the destruction of flies:

Quassia 8 parts, water 500 parts, molasses 125 parts. Boil the quassia and water ten minutes, strain and add the molasses.

Flies are attracted by this liquid and are soon killed by it.—*Ibid*, Dec. 1852.

Hainaut's Dentifrice.—Powdered tormentilla 80 parts, powdered orris root 40 parts, cream of tartar 20 parts, fused chloride of calcium 4 parts. Reduce the chloride rapidly to powder and mix it with the other ingredients.

Insolubility of Alum in Brandy.—Physicians sometimes direct a mixture of alum and brandy as a bath. When 100 grains of powdered alum are macerated for several days in 1000 grains of French brandy, sp. gr. 947°, the filtered liquid contains hardly a trace of the salt, as 100 grains of it on evaporation yielded less than half a grain of extract-like matter with but little taste of alum. W. P., Jr.

Bottle for Dropping Liquids.—Mr. George Dymond, of Manchester, England, suggests a decanter-shaped bottle with a hollow stopper of peculiar construction for dispensing liquids by drops. The bore of the stopper follows its axis until above the lip of the bottle, when it divides to the right and left so as to produce two apertures parallel with each other, one of these being much larger than the other. When the bottle is filled with a liquid and inclined with the small aperture down, "a perfectly regular succession of drops of uniform size escape, the air being at the same time admitted through the opposite aperture. The position of the bottle being reversed, a larger supply of liquor is obtained by means of the large aperture of the stopper, whence it issues in a moderate and uniform stream."

The author considers this bottle particularly valuable in reference to volatile liquids, like ethereal solutions, hydrocyanic acid, etc., where loss by evaporation is liable to occur. There is a glass cap to cover the top of the bottle, ground to fit the lip, which prevents evaporation when the bottle is not in use, and adapts it for holding test liquids.—*Pharm. Journ.*, March, 1853.

Remedy for the Sting of Bees.—M. Gumprecht recommends the expressed juice of the honeysuckle (Lonicera caprifolium) as a remedy for the stinging of bees. The stung place is to be rubbed with the juice, which may be kept in closely stopped bottles for this purpose.—*Chem. Gaz.*, Jan. 15.

Saccharized Hydrate of Magnesia.—A preparation under this name was introduced by Mr. White, of Cork, who describes it as consisting of "pure hydrate of magnesia, uncombined with any acid, and in the finest gelatinous state," sweetened with sugar and flavored with an aromatic. Each ounce contains a quantity of magnesia equivalent to 20 grains of the carbonate. This is a convenient form in which to administer magnesia, especially to children, as it is not at all disagreeable, and the magnesia being in suspension there is no sediment.—*Pharm. Journ.*, Oct. 1852.

This preparation can be made by dissolving two ounces (*av.*) of sulphate of magnesia in half a pint of water, and precipitating the solution with solution of caustic soda, washing the gelatinous hydrate of magnesia with boiled water by decantation, and finally introducing it into a pint bottle with half a pint of simple or ginger syrup, and sufficient water to make the whole measure a pint.

W. P., Jr.

SYRUP OF PYROPHOSPHATE OF IRON.

By E. Soubeiran.

Pyrophosphate of iron and soda has been introduced into therapeutics, as having the particular advantage of being supported by many patients whose stomachs are offended with other preparations of iron. I have seen two patients in this condition. A solution of pyrophosphate, according to the following formula was prescribed.

Take of dry Ter-sulphate of iron, - - 6 grms. (ʒiss.)
Crystallized pyrophosphate of soda, 55 grms. (ʒxiv.)
Water, q. s. to make a litre of solution (Oij ʒij.)

But this liquid having a disagreeable taste, I have prepared the following syrup, which is taken without difficulty by women and children.

I will first state that pyrophosphate of soda is prepared by drying the ordinary rhombic phosphate, fusing it at a red heat, dissolving the mass in boiling water, filtering and crystallizing. A salt having the formula, $2Na\,O+PO^5+10Aq.$ is obtained. It contains 40 per cent. of water of crystallization, and is known by its affording a white precipitate with nitrate of silver instead of yellow as the ordinary phosphate.

The pyrophosphate of iron, corresponds to the soda salt, and has the formula, $2Fe^2 O^3 + 3PO^5$. It is obtained by double decomposition between ter-sulphate of iron and pyrophosphate of soda. It is insoluble in water, but is soluble in a solution of pyrophosphate of soda.

I will now speak of the syrup of pyrophosphate of iron.

Take of	Ter-sulphate of iron, in powder, -	55 grains.
	Water, - - - - - -	1 fl. oz.

Dissolve the salt in the water, cold, by occasional agitation for several days, or it may be more quickly effected by digestion at a moderate heat in a flask placed in a water bath.

On the other hand,

Take of	Pyrophosphate of soda, crystallized,	462 grs.
	Pure water, - - - -	7½ fl. oz.
	Distilled mint water, - - -	3½ fl. oz.

Dissolve without heat, and add to the solution the solution of sulphate of iron previously made and agitate. The precipitate which first forms quickly, redissolves when the liquid is filtered and poured on 19 ounces troy of white sugar, contained in a bottle. Dissolve without heat. It is necessary to make the solution without heat, or, at least, below the temperature of 120° F., otherwise the syrup will assume the color of wine dregs, and at 160° to 180° F. it becomes very deep. A tablespoonful of this syrup (about five drachms troy,) contains 2 centigrammes (about ½ of a grain) of iron in the state of double phosphate.

If the ter-sulphate of iron is not at hand, it may be prepared for the occasion quickly as follows. For the quantity necessary for the preceding formula.

Take	Crystallized proto-sulphate of iron,	77½ grains
	Sulphuric acid, - - - - -	25 grains
	Nitric acid, - - - - - -	Q. S.

Put the sulphate in a capsule with a little water and the sulphuric acid, heat and add nitric acid in drops, until the mixture ceases to disengage nitrous fumes; then evaporate to dryness at a moderate heat. The product is the ferric salt free from excess of acid.—*Jour. de Pharm.* Jan. 1853.

MUNIFICENCE OF M. ORFILA.

[Through the *Journal de Pharmacie* for February, 1853, we learn that M. Orfila, the distinguished chemist and toxicologist of Paris, having, for some time, intended to bequeath certain sums of money for scientific purposes, to several of the institutions of France, determined to make them donations instead of bequests; and, on the 1st of January, addressed letters to the several representatives of the institutions to be benefited, announcing the fact. The whole sum presented is 121,000 francs. The Orfila Museum, the Academy of Medicine, the Preparatory Medical Schools of Bordeaux and Angers, and the School of Pharmacy of Paris, are the recipients of the bounty. The following letter to the Director of the latter institution we translate entire.—*Editor Amer. Pharm. Jour.*]

LETTER OF ORFILA TO THE DIRECTOR OF THE SCHOOL OF PHARMACY OF PARIS.

Paris, January 1st, 1853.

Mr. Director and Dear Colleague:—Thirty-two years as an Examiner in the Special School of Pharmacy of Paris, has enabled me to appreciate the distinguished merit and the honorable zeal of its professors, as well as the remarkable aptitude of most of the candidates who have assiduously followed their instruction. I will preserve, while I live, a grateful remembrance of the happy relations which have unceasingly existed between you, your colleagues, and myself, and I am happy in feeling able at this time to furnish you a proof of the desire which animates me, by contributing some little to enhance the renown of an institution which is honorable to France, and of which you are the worthy director.

I place at your disposal an inscription of 500 francs per annum in the three per cents, designed to found a prize of 1000 francs, which shall be awarded every two years, dating from the commencement of the session for the year 1856. This inscription represents a sum of 14,000 francs, (at 84 the cost price.)

This prize is not to be divided. If it is not awarded, the same question is to be again put up for competition, and the prize will be then 2000 francs. If the prize is not gained the second time, the same question will be proposed for the third time, the prize being 3000 francs; if, notwithstanding the delays, the question has not been properly answered, and the prize not adjudged, the sum of 3000 francs is to be paid into the treasury of the Association of Physicians of the department of the Seine, which I founded in 1833.

Allow me, Mr. Director, to state briefly a certain number of questions, which, in my opinion, should be first proposed.

1st. To extract from the most important compound medicines all the proximate principles, or other active substances, belonging to them. We should not believe, because an alkaloid, or any other body possessing a certain degree of power, has been obtained from a drug, that science can do no more; in fact, a substance extracted from a compound medicine may account for a certain portion of its therapeutic effects, but often, many other effects are due to ingredients not isolated. It is necessary to be quite certain in this regard, that all which relates to the action of compound medicines on the animal economy may be completely understood, and the part which the different active principles take in this action ascertained. This question will furnish, without doubt, a number of subjects for prizes.

2d. To determine, by experiment, what are the substances in the several kingdoms which should never be associated in the same formulæ, because they decompose each other, with products completely inert. To ascertain, on the contrary, which are the substances, which, in combining and in decomposing, yield medicines gifted with a certain activity useful to the physician. To indicate the kind of changes that occur in these various substances, and the nature of the new compounds formed.

3d. To explain the best processes for discovering certain sophistications which have not yet been the object of serious study.

4. To decide what modifications certain drugs, of vegetable and animal origin, will undergo by continued exposure to heat and light, and to dry or moist air, etc., and to say whether the products which result from the alteration of these drugs will cause accidents, in case they are employed in medical practice.

5th. To analyze the saliva, the urine, and the perspiration in the principle acute diseases called specific, so as to be able to state the changes that occur in those fluids; added to which, the expired air should be examined.

6th. To search if, in lying-in women, the milk partially abandons the galactiferous organs, and is carried to other vessels, and especially if, in the so-called milk diseases, to which women recently confined are sometimes subject, the milk has been carried to the bladder, into certain serous cavities, &c.

7th. To submit the mineral waters, yet but little known, to analysis, and to re-study those which enjoy great celebrity, with the object of ascertaining whether some new active substances cannot be

discovered. If the problem proposed by the Academy of Medicine, in 1851, on the occasion of the Capuron prize, has not received a satisfactory solution, it may be removed from competition.

Such, Mr. Director, are the questions which need elucidation. The demands of science will lead you, I have no doubt, to propose other questions, either before or after those which have been indicated. I am satisfied of the sagacity of the Professors in this matter, and accept in advance the programme they may offer.

Receive, my dear colleague, the assurance of my distinguished consideration and affectionate regard, ORFILA.

Jour. de Pharm., Feb. 1853.

ON THE MANUFACTURE OF WAX CANDLES.

(From the Reports of Juries of the Great Exhibition.)

Under the name of wax are included substances of various origin, and of very different composition. The wax employed in the manufacture of candles is secreted by the honey bee, which has the power of producing this substance from its food (sugar). At one time it was thought that the bee collected the wax ready formed from plants, until Liebig advanced the contrary opinion, which was subsequently corroborated by the experiments of MM. Dumas and Milne Edwards.

A wax known as Chinese wax, and resembling spermaceti in appearance, was formerly supposed to be a vegetable wax; but the researches of Sir George Staunton and M. Stanislaus Julien have demonstrated that it is the secretion of a male insect, the Coccus ceriferus, which deposits it on the tree on which it feeds, particularly the Rhus succedaneum. We owe to M. Brodie a knowledge of the true chemical composition of wax. This chemist, by his recent elaborate researches, has shown that Chinese wax is a compound of a peculiar fatty acid (*cerotic*) and the oxide of an alcohol radical (*cerotyl,*) and is consequently cerotate of oxide of cerotyl. Ordinary bees'-wax he finds generally to contain twenty-two per cent. of free cerotic acid, which is soluble in alcohol, and, with potassa, forms readily a soap. The residue, which is nearly insoluble in alcohol, and which has been usually called myricin, he has shown to be a compound of palmitic acid and the oxide of another alcohol radical (*melissyl,*)

that is, palmitate of oxide of melissyl. He has likewise been able to prepare from wax two new solid hydrocarbons similar to paraffin.

Paraffin would be much too costly to be converted into candles if made from wax, as its preparation entails a considerable loss of material; it is, nevertheless, desirable that it should be obtained cheaply from some source, as it is much better adapted than any other substance for illuminating purposes, from its containing no element besides carbon and hydrogen, which are united in equal equivalents. It is therefore exactly of the same composition in a hundred parts as olefiant gas, which gives to ordinary coal and oil gases their illuminating power. Paraffin candles have been made from paraffin obtained by distilling bituminous schist; but far more interesting specimens are those produced by James Young, which seem to realize the great problem which the rare sagacity of Liebig pointed out as far back as ten years ago. "It would certainly be esteemed one of the greatest discoveries of the age," says he, "if any one could succeed in condensing coal-gas into a white, dry, solid, odorless substance, portable, and capable of being placed upon a candlestick or burned in a lamp." Now, this very problem Mr. Young appears to have accomplished by distilling coal at a comparatively low temperature, whereby he obtains, instead of gas, the product of intense heat—a mixture of liquid and solid substances; the former capable of being burned in lamps like sperm oil or of being used for lubricating machinery, the latter yielding a beautiful mould candle, as solid and white as any prepared from paraffin from other sources. The Reporters have not as yet been able to obtain a fuller account of the economical bearings of Mr. Young's process, which will most likely be considered in the Report upon another class; but they confidently hope that this truly beautiful discovery will not meet with similar difficulties as the plan proposed some years ago for making paraffin candles out of Irish peat. If coal-paraffin can actually be obtained in sufficient quantity and at moderate cost, we may witness another revolution in the processes of illumination; and the brilliant discoveries of Chevreul, but lately threatened by the splendor of the electric light, may be eclipsed by the general adoption of solidified coal gas candles.

In most countries wax intended to be made into candles is previously bleached by a process presently to be described. That this, however, is not always the case, we find by specimens exhibited in the Egyptian and Tunisian Courts. The candles in the latter, which we may infer resemble those of the classical ancients, are true yellow wax "dips," and have a very ungainly appearance. The bees'-wax from which they are made is principally produced in the province of Kirwan; and the primitive method usually adopted for their manufacture consists in merely melting the wax in a proper vessel, and then dipping the wick repeatedly into it. Although such is the usual mode, the wax is sometimes bleached, and, of course, finer candles produced: but none such were exhibited. No animal fat is employed in Tunis for the manufacture of candles, although stearic candles of European manufacture are imported, and are in general use.

Wax is more valuable when bleached, not only on account of its greater beauty, but also from the removal by this operation of impurities which would clog the wick during combustion. It may be bleached by chlorine; but the process is of no value, because its constituents retain a portion in combustion, and hence hydrochloric acid is given off in burning.

The method of bleaching employed is very simple, although tedious. The following, with some trifling variation, is the plan adopted in most countries:

Wax bleaching.—The wax is cut up into small pieces and placed in a vat, into which steam is made to pass through a perforated coil of pipes; a small quantity of very dilute sulphuric acid being added, in the proportion of one pint measure of strong sulphuric acid (oil of vitriol) to one ton of wax, and the whole well agitated for some time. This addition of sulphuric acid facilitates the separation of impurities which subside into the acidulated water.

As soon as, by subsidence, the wax has become bright, it is removed into a trough, with holes in the bottom about the size of an ordinary quill. The melted wax runs through these holes in small streams on to a wooden cylinder, which is made to revolve, and the lower half of which is immersed in a cistern of cold water. The motion of the cylinder carries a layer of water, on which the streams of wax fall and form exceedingly thin ribbons, varying from half an inch in breadth. These ribbons,

by the revolution of the cylinder, dip under water, and as they rise upon the opposite surface are removed, and spread out thinly and evenly on tables placed in the open air, so as to be exposed to the action of the sun and air for a period varying from five to ten weeks. Once or twice during that period the wax is again subjected to the same process of melting; it requires also frequent turning, so as to present every portion to the bleaching agency of sunlight.

The fusing point of wax is raised by bleaching, for yellow wax fuses between 62° and 63° C. (144° and 146° F.,) and bleached wax between 64° and 65° C. (147° and 149° F.)

All waxes are not found to bleach with equal facility, according to the statement of Mr. Barclay. For example, English, Hamburgh, Odessa, Portuguese, Mogadore, Zanzibar, East and West Indian, and North American waxes bleach very readily, whilst those from Cuba, Dantzic, Konigsburg, Gambia, and Gabon, are only bleached with difficulty, and seldom acquire a good color.

Notwithstanding the difficulty with which Gambia wax is bleached, and its liability to become of a rusty brown, that country furnishes the greater part of the wax which is imported into Great Britian. Large quantities are likewise imported from Mogadore, the East Indies, particularly Ceylon and Singapore, and North America. The Mogadore wax is frequently largely adulterated with fat.

From Brazil a curious wax has been imported, the product of a black bee, which hives under ground. It is soft, and exceedingly tenacious, and of a dark mahogany color. It does not appear in the slightest degree bleached after exposure to the sun. A considerable quantity might be imported, but no use has yet been found for it.

The English wax is the most esteemed of all; but the small quantity produced is absorbed for various purposes without bleaching, on account of its fine quality, and its brightness and fragrancy.

In 1850 the quantity of bees'-wax imported for home consumption into Great Britain was 10,761 cwt., besides a small quantity of vegetable wax amounting to only five cwt. There is no duty on wax. 1067 lbs. of wax candles were also imported, and paid £9 duty.

Wax is not well adapted for moulding on account of its tendency to adhere to the mould, and its great contraction in cooling; and though these difficulties may be overcome, yet it is found more advantageous to make wax candles in the manner about to be described, as they are found to burn much better.

The first process consists in warming the wicks in a stove, and then suspending them to a hoop placed over a vessel of melted wax. The workman pours the melted wax with a ladle on to each wick in succession, and at the same time causes the wick to revolve on its axis by the motion of the fingers. When the candles are about one-third made, they are allowed to cool for a time, and the operation of pouring repeated until the candles are about half made, which is ascertained by the eye or by weighing. Whilst still warm they are removed from the hooks and subjected to a process of rolling between two marble slabs, so as to render them uniform in thickness. The upper end of each candle is now formed by cutting down the wax to a metal tag which covered one end of the wick. The candles are then again suspended to the hoops, the end which had previously hung downwards being now upwards, and the operation of basting and rolling repeated as often as necessary. Lastly, the lower ends of the candles are cut off to make them of equal length.

The wicks of wax candles are always made of twisted unbleached Turkey cotton, the fibre of which appears better to resist the temperature of the highly heated wax during combustion. Plaited wicks are not adapted to wax candles, as the plaiting, by diminishing the capillary action, entails the employment of so large a wick that it obscures the light, besides which it is apt to curl round and round in the flame, and to collect a quantity of soot.

The large wax candles used in churches are formed by laying the wick on to a slab of wax, which is then folded over on the wick, and the candle finished by rolling.

Long wax tapers are made by winding the wick on a drum, and then leading it under a guide roller, placed in a trough of melted wax. From this it passes through a series of holes, progressively smaller, on to a second drum, the operation resembling somewhat that of wire-drawing. A little turpentine is added so as to render the wax pliable enough to wind.—*London Pharm. Journ.*, Feb., 1853.

ON THE DETERMINATION OF THE COMMERCIAL VALUE OF INDIGO.

Wittstein advocates the use of the deoxidation test proposed by Berzelius and Pugh, and considers that the discredit into which it has fallen is the result of unfounded prejudice. He further points out the several defects of the other modes of testing indigo. The use of sulphuric acid as a solvent of the blue coloring matter is objectionable; first, because it takes up other constituents of indigo, partly organic, and worthless as dying materials, partly inorganic; secondly, because there is no means of separating the indigo blue from the other dissolved substances. He considers the method proposed by Reinsch, of determining the commercial value of indigo by observing the intensity of color of the sulphuric acid solution at a certain definite point of dilution as of small value, inasmuch as it gives only relative results, and that with no very great accuracy. Of the actual per centage of blue coloring matter it gives no indication.

The use of chlorine he considers as still more open to objection; in the first place, because it furnishes only relative results, and in order to obtain absolute results, it must be ascertained how much chlorine a certain weight of pure indigo blue requires for its decolorization; secondly, commercial indigo contains various other organic substances, colored and colorless, which likewise take up chlorine, consequently the percentage of indigo blue, calculated from the quantity of chlorine consumed, is always too high and requires correction, for it cannot safely be assumed that the chlorine acts first upon the indigo blue.

In order to obtain some positive data connected with the use of the chlorine test, Wittstein made some experiments to determine the quantity of chlorine requisite for the decolorization of a certain weight of pure indigo blue, assuming at the outset that this quantity was constant. He was, however, unable to arrive at any practically available results. He used the solution of indigo highly diluted; the operation was conducted in a long-necked flask, in order to avoid any interruption of the action by the renewal of water which had evaporated, and the solution of salt was added at regular intervals; notwithstanding all these precautions the quantities of chlorate of potash requisite to produce decolorization in several successive experiments were very

unequal. He considers that these discrepancies are dependent upon circumstances with which we are not sufficiently acquainted; for instance, the duration of the process, a small quantity of salt producing as great an effect in a certain time, as a larger quantity in a less time; but when the reaction occupies too long a time, the liquid becomes concentrated and the result impaired. The decolorization of weak solutions cannot be effected at the ordinary temperature only after the lapse of some time; if they are employed at an elevated temperature the discrepancy in the results is increased still more.

Wittstein, therefore, comes to the conclusion, that the old reduction test should be again adopted, since it furnishes not merely relative, but absolute and tangible results, which, when a few precautions are taken, are very trustworthy. It is, moreover, easy to carry out, and does not occupy more than two days. He gives the following directions for its application:

Ten grains of indigo are rubbed with water in a porcelain mortar, to this twenty grains of hydrate of potash are added, together with a few drops of water, the rubbing being continued, and then forty grains of sulphate of iron, the mass mixed with water, so as to form a thick paste, and introduced into a six ounce stoppered bottle, which has been previously weighed; the mortar should then be rinsed and the bottle nearly filled up with water. After inserting the stopper the whole is weighed and well shaken for some time. After the lapse of a few hours the indigo is decolorized and dissolved. The mixture is then allowed to settle, the clear liquid is poured into a glass cylinder as completely as possible, and the bottle again weighed. The clear liquid is then to be treated with hydrochloric acid, the blue precipitate collected upon a weighed filter, washed with water, dried and weighed. By means of a proportion it may be ascertained how much indigo blue is contained in the ten grains of indigo; if, for instance, the contents of the bottle weighed 3140 grains, the residue left on decantation, 535 grains, and the 2605 grains of clear liquor yielded 2.5 grains of indigo blue, then:—

$$2605 : 3140 = 2.5 : x$$

$$x = 3.01.$$

Consequently, the indigo examined would contain 30.1 per cent. of pure coloring matter.—*Vierteljahresschrift fur prakt Pharmacie*, from *London Pharm. Journ.* March, 1853.

ON THE MEAT BISCUIT OF GAIL BORDEN.

By B. W. M'Cready, M. D.

The preservation of animal food, by which the surplus products of one section of country can be made available for the use of another, and by which, too, it can be made serviceable in long journeys by land or sea when other supplies cannot be obtained, is an object of the highest importance. The employees of the Hudson's Bay Company convert their meat into what is called pemican. The muscular parts of the animal are cut into thin strips, thoroughly dried, reduced to powder, and mixed in proper proportion with melted fat. This answers perfectly the purposes for which it was intended. All the nutriment of the meat is preserved, it is compact, easily transported, and keeps for a long time, particularly in high latitudes. There are objections, however, to the process, which prevent it being used on a large scale.

In curing meat by salting it, the salt acts mainly by abstracting moisture from the meat. When fresh beef is covered with dry salt, the salt soon becomes moist, and is finally dissolved. The water is supplied by the beef; the latter is reduced in bulk, it becomes drier and corrugated. The same process goes on when meat is placed in strong brine, and the abstraction of moisture continues for a considerable time, until the greatest possible amount is withdrawn, and the meat becomes dense and hard. Unfortunately, the moisture does not consist of simple water; it contains, dissolved in it, various salts, of which potash is the principal base, and forms what has been termed the juice of the flesh. Now, in the living animal, these salts play an important part in the wonderful processes which constitute nutrition. During life, together, with the other materials of the body, they are exposed to constant waste, and need to be constantly replaced. Salt meat, deprived of these necessary ingredients, which are to some extent replaced by the salt itself, does not contain all the elements which are necessary to perfect nutrition: consequently, those fed on it exclusively for any length of time become ill, they are affected with scurvy.

Mr. Gail Borden, of Galveston, Texas, residing in a land where cattle are numerous, and meat exceedingly cheap, has at-

tempted another method of rendering the abundance of his adopted State serviceable in supplying the wants of other countries, in that respect less favorably situated. In doing this, Mr. Borden has hit upon a preparation, which, though it may not be all its more sanguine friends claim, is still exceedingly useful, and merits, perhaps, the encomium which Professor Lindley, in his lecture on the results of the Great Exhibition of 1851, in London, assigns to it, as being the most important of the many wonderful things which were there exposed for the admiration of the English public.

In the preparation of the Meat Biscuit, according to the specification of the patent, meat from animals in good condition, and fresh from the slaughter-house, is divided into small pieces by means of a cutting machine, and is then boiled in a large quantity of water for sixteen hours. The soup thus made is passed through strainers of wire-cloth, and then evaporated by steam heat in a pan or tub, or by means of the vacuum-pan, to the consistence of thick treacle. Previous to, and during this process, all the fat which rises to the surface is removed. With the extract thus obtained, good flour is incorporated, until the whole attains a consistence proper for rolling into a thin layer, which is then cut up by a common biscuit machine. The biscuit are then baked in a slow oven until they are thoroughly crisp and dry. The quantity of flour employed, according to Mr. Borden, is about three parts by weight to two parts of the syrup, and eleven pounds of beef produce one pound of extract. The biscuit are afterwards ground to a coarse powder, and packed away into air-tight casks or tin cases.

In this process, it will be observed, that in the first place all the fat is removed; in the second place, as neither fibrin nor albumen are, to any extent, soluble in boiling water, they likewise will be separated by the wire gauze through which the decoction is strained. The extract can contain then only the flocculi of coagulated albumen, which escape through the meshes of the strainers, together with a minute portion of the albumen, which, according to Dr. Bence Jones, is altered by the continued boiling, being rendered soluble, and converted into what Dr. Jones terms albuminose, the gelatine, the principles kreatine, kreatinine, inosinic acid, which in a comparatively recent period,

have been discovered to exist in flesh, and the various salts which form an important ingredient of its juice.

In the part which flesh, taken as food, plays in nutrition, it is now generally admitted, that the fat serves as respiratory food, the carbon and hydrogen of which it is composed combining with oxygen in the course of the circulation, and becoming converted into carbonic acid and water, and thus maintaining the animal temperature. What escapes oxidation is either stored away directly as fat, for the future use of the system, or passes out of it with the various excretions. The fibrin and albumen serve mainly to nourish the muscles, imparting by their decomposition strength and activity to the body and maintaining the activity of the heart and of the various other muscles of organic life.

It cannot consequently be admitted that the meat biscuit, or any similar preparation, contains the whole nutriment of the flesh from which it is made; on the contrary, the fibrin, the albumen, and the fat, which in reality constitute its most nutritive portions, are removed, and, for all purposes of nutrition, lost. What, then, are its advantages, and what purpose does it really serve in the human economy.

"Fresh meat when incinerated," says Liebig, "leaves three and one-half per cent. of the weight of the dried flesh as salts. Meat, exhausted by boiling, leaves hardly one per cent. Ten pounds of fresh meat yield in all, 42.93 grms. (two and a half oz. avoirdupois, or 662.8 grains;) but when these ten pounds are exhausted by lixiviation and boiling, 544.7 grains of the 662.8 enter the soup, and there remains in the meat only 118 grains. The fresh meat contains in its ash upwards of 40 per cent. of potash, the exhausted flesh only 4.78 per cent. of that alkali." It is on the presence of these salts, we believe, that the restorative effects of soup and of extracts of flesh mainly depend. They are essential ingredients of the body, and are necessary in the minute chemical changes of which vital activity is the product; they are constantly passing away with the excretions, and required to be constantly renewed; and in the form of aliment under consideration, they are presented to us in a condition and in proportions best suited for immediate assimilation.

Liebig attributes much of the effect of extract of flesh to the kreatinine, a nitrogenous compound, somewhat analogous to

theine in its composition, and which exists in the juice of the flesh in exceedingly minute quantity. There is no proof, however, that kreatinine produces any such effect, and it is more probable that this substance is merely one of that series of bodies, the result of the decomposition of the tissues, which, commencing with muscles and nerve, terminates with urea.

In his biscuit, Mr. Borden unites wheaten flour in large proportion, with the extract of meat. He thus replaces the animal fibrin and albumen by the gluten of the wheat, while the starch, as respiratory or heat-producing food, takes the place of animal fat; the whole forming an economical, portable, and nutritious food, which can be preserved for an indefinite length of time. Biscuit, which had been in the Arctic ocean with the Grinnell Expedition, and another portion, which had made the voyage to Australia and back, was perfectly unaltered, and when cooked, formed as palatable a soup as could be made directly from fresh meat.

The real merits of Mr. Borden's preparation can then be very briefly summed up. It affords a cheap and nutritious aliment, perfectly suited to the wants of convalescent patients, and in hospital practice must be invaluable.

On long voyages, it affords a nutriment abounding in those substances the want of which renders the continued use of salt provisions so unwholesome. It will probably be found beneficial in the treatment of scurvy, and will do much to prevent its occurrence.

Under similar circumstances, it affords a change of diet, which could not otherwise be obtained, unless at a greatly increased expense. Its cheapness renders its use for ordinary consumption in families a matter of economy.

Finally, it is compact, portable, and may be preserved unaltered for a great length of time.—*N. Y. Jour. Pharm.* Feb., 1853.

[The following is Mr. Borden's patent.—Ed. Journ. Pharm.]

Patent granted to Gail Borden, Jun., *for Improvements in the Preservation of certain Animal and Vegetable Substances.*—This invention consists in combining flour, farina, meal, or pulverized biscuit with a concentrated extract of the nutritive portions of animal flesh, and drying or baking the same, so as to form a portable desiccated meat-bread or biscuit, containing a large quantity of nutriment in a small bulk, and suited for the use of shipping, armies, emigrants, travellers, hospitals, and for family use.

In carrying out this invention, the patentee takes animal flesh, of any kind suitable for eating, that is fat and in good condition; and in order to extract all its nutritive juices, he macerates it by boiling in a quantity of water until all its nutritious or alimentary properties are obtained in the decoction. The extract or decoction is filtered through strainers of wire-cloth, and further defecated by settling; after which it is reduced by evaporation to about the consistency of thick treacle. The evaporation may be effected in a pan or tub, with a steam-pipe coiled at the bottom, or by the vacuum process employed in sugar refining; and previous to and during this operation, all the fat or oily matter that rises to the surface is to be skimmed off, or otherwise removed. The animal extract, which has been reduced to the above-mentioned consistency, is mixed with flour, farina, meal or pulverized biscuit, until a dough is formed sufficiently stiff to be rolled into a convenient form, and cut into pieces by a common biscuit machine. By mixing the flour with the extract in a hot state, the dough is rendered stiffer when cold, and more of the extract is combined with a given quantity of flour, which may, if preferred, be kiln-dried. The dough is desiccated in a drying chamber, or baked in a kiln or oven. The heat employed for this purpose may be equal to that of an ordinary oven after a batch of bread has been baked in it. The dough should be baked slowly, and with great care, until it attains the same degree of dryness as the common biscuits or cracknells. The biscuits manufactured in this manner may be ground into meal for greater convenience in cooking, and may be packed, either in the state of meal or unground, in air-tight casks or cases, or in tight bags of gutta percha, varnished cloth, or other material that will keep out air and moisture.

To make soup, the biscuit is ground or pulverized, and stirred into sufficient cold water to form a thin batter, which is allowed to stand from five to twenty minutes; and then it is added to boiling water, care being taken to stir frequently during the process, especially before it boils. The boiling is continued from ten to thirty minutes, according to the fineness of the biscuit-meal, until it is dissolved in the water; and salt, pepper, and other condiments are added, to suit the taste. 1 oz. of the biscuit will make a pint of soup. Cooked vegetables, of various kinds, may be used in the soup.

It is stated that this biscuit is not liable to the attacks of weevils and other insects, to which ordinary biscuits and most descriptions of food are subject. It is entirely free from oil or grease, and therefore less liable to deterioration. The excellence of the biscuit depends upon the quantity of animal nutritious matter employed in its manufacture. The extract should therefore be reduced, by the process of evaporation, to about one-eleventh of the weight of the flesh, including its proportion of bone and fat; this is the proportion when fat and well-conditioned beef is used. The patentee mixes about 2 parts of the extract with 3 parts of flour, equal to 5 parts; but about twenty per cent. in weight of this is lost in the baking. The

biscuit may be prepared for use in a few minutes, even in a chafing-dish, over a few coals or a spirit lamp. This invention presents another advantage,—the meat biscuit can be made in the colonies and other countries where meat is abundant and cheap; and, by reason of its concentration and portability, can be exported, at comparatively small cost, to countries where meat is dear and less abundant.—Sealed Sept. 5, 1851.—*London Chem. Gaz.*

NOTES UPON THE DRUGS OBSERVED AT ADEN, ARABIA.

By James Vaughan, Esq.

Member of the Royal College of Surgeons of England, Assistant Surgeon in the Bombay Army, Civil and Port Surgeon at Aden, Arabia.

Communicated by Daniel Hanbury.

(Continued from page 154.)

Aloes, called *Sibr* by the Arabs, and *Eliâ* by the natives of India. But very little of the best description of aloes is brought to Aden; the port of Maculla being much nearer to Socotra, nearly the whole produce of the island is carried thither, whence it is transhipped to Bombay. The price of the drug here is four rupees six annas (8*s*. 9*d*.) the *maund*. An inferior description of aloes, called here *Black Aloes*, is brought to Aden in large quantities from the interior. This sells for two rupees the *maund*, and 1600 pounds are reported to have passed the Custom-house last year (1851.)*

Senna.—*Cassia elongata* (Lemaire-Lisancourt) is the species of *Cassia* which grows commonly in southern Arabia and on the opposite coast of Africa. *Senna Mekki* is the name by which it is known here and in India. Of late years the trade in this drug has considerably increased, a large quantity being taken by the Americans in exchange for their cotton long-cloths, the principal material used for domestic purposes by the Arabs of the interior. Little or no senna is sent from the Somali country for exportation, though the plant is common there and grows close to the sea-beach. The Somalis seem to be ignorant of its purgative properties. Senna abounds throughout Yemn and Hadramaut; from thence it is transported to Mocha and other ports of the Red Sea

* Three samples of Aloes accompanied this notice:
1. Aloes from Hadramaut.
2. Socotrine Aloes.
3. Aden or Black Aloes.

The last named has a fœtid, sulphurous odor.—D. H.

for exportation. Latterly, a considerable quantity has been brought into Aden from the interior. Last year, thirty tons passed through the Custom-house.*

Indigo, called by the Arabs and natives of India, *Neel*. A large quantity of this article, much inferior to the Indian indigo, is manufactured at Mocha and other towns in southern Arabia. It is extensively used by the Arabs in dyeing the white cotton long-cloths above mentioned, and in fact it pervades almost every part of their dress. Whether unavoidably, because they are far from being adepts in dyeing or from design, the color generally stains their half-naked bodies, and this together with the peculiar smell of Indigo, they seem to consider highly genteel, thus forming a striking contrast to the females, and especially to the Jewish women, who prefer a yellow tinge, and to that end dye their skins with a decoction of turmeric.

The indigo above-mentioned sells in the Aden market for eleven rupees the *maund* of 28 lbs. Sixteen hundredweight of this article were entered at the Custom-house last year.†

Kât, the name of a drug which is brought into Aden from the interior and largely used, especially by the Arabs, as a pleasurable excitant. It is generally imported in small camel loads, consisting of a number of parcels each containing about forty slender twigs with the leaves attached, and carefully wrapped so as to prevent as much as possible exposure to the atmosphere. The leaves form the edible part, and these when chewed are said to produce great hilarity of spirits and an agreeable state of wakefulness. Some estimate may be formed of the strong predilection which the Arabs have for this drug, from the quantity used in Aden alone, which averages about 280 camel loads annually. The market price is 1¼ rupees per parcel, and the exclusive privilege of selling it, is farmed by the government for 1500 rupees per year. Forskäl found the plant growing on the mountains of Yemen, and has enumerated it as a new genus in the class Pentandria, under the name of *Catha*. He notices two species and

* The author has transmitted two samples of Senna, marked respectively *Aden Senna* and *African Senna*. They would be known in the London market as *Inferior East Indian Senna*.—D. H.

† An excessively impure indigo, leaving after ignition no less than 94.4 per cent. of ashes. Two samples of fine indigo from another source, afforded respectively only 6.2 and 9.2 per cent.—D. H.

distinguishes them as *Catha edulis* and *Catha spinosa*. According to his account it is cultivated in the same ground as coffee, and is planted from cuttings. Besides the effects above stated, the Arabs, he tells us, believe the land where it grows to be secure from the inroads of plague, and that a twig of the *Kât* carried in the bosom, is a certain safeguard against infection. The learned botanist observes with respect to these supposed virtues: "*Gustus tamen foliorum tantam virtutem indicare non videtur.*"*

Like coffee, *Kât*, from its acknowledged stimulating effects, has been a fertile theme for the exercise of Mahommedan casuistry, and names of renown are ranged on both sides of the question, whether the use of *Kât* does or does not contravene the injunction of the Koran: *thou shalt not drink wine nor anything intoxicating*. The succeeding notes borrowed chiefly from De Sacy's researches may be deemed worthy of insertion here.

Sheikh Abd-ool-Kâder Ansari Jezeri, a learned Mahommedan author, in his treatise on the lawfulness of the use of coffee,† quotes the following from the writings of Fakhr-ood-Deen Mekki: —"It is said that the first who introduced coffee was the illustrious saint Aboo Abdallah Mohammed Dhabhani ibn Said; but we have learned by the testimony of many persons, that the use of coffee in Yemen, its origin and first introduction into that country, are due to the learned and godly Ali Shadeli ibn Omar, one of the disciples of the holy doctor Nasr-ood-Deen, who is regarded as one of the chiefs among the order Shadheli, and whose worth attests the high degree of spirituality to which they had attained. Previous to that time they made coffee of the vegetable substance called *Cafta*, which is the same as the leaf known under the name of *Kât*, and not of *Boonn* (the coffee-berry,) nor any preparation of *Boonn*. The use of this beverage extended in course of time as far as Aden; but in the days of Mohammed Dhabhani, the vegetable substance from which it was prepared disappeared from Aden. Then it was that the Sheik advised those who had become his disciples to try the drink made from the *Boonn*, which was found to produce the same effect as the *Kât*, inducing sleep-

* *Flora Egyptiaco-Arabica, Hauniæ*, 1775. 4to., page 64.

† For an extract from this treatise, *vide Chrestomathie Arabe, ou Extraits de divers écrivains Arabes. tant en prose qu'en vers, avec une traduction Française et des notes, par M. le Baron Silvestre de Sacy. Seconde édition. Paris* 1826. Tome I, p. 412.

lessness, and that it was attended with less expense and trouble. The use of coffee has been kept up from that time to the present."

D'Herbelot states that the beverage called *Cahuat al Catiat*, or *Caftah*, was prohibited in Yemen in consequence of its effects upon the brain.* On the other hand a synod of learned Mussalmans is said to have decreed: that as beverages of *Kât* and *Cafta*† do not impair the health or impede the observance of religious duties, but only increase hilarity and good humor, it was lawful to use them, as also the drink made from the *Boonn* or Coffee-berry.

I am not aware that *Kât* is used in Aden in any other way than for mastication. From what I have heard, however, I believe that a decoction resembling tea, is made from the leaf by the Arabs in the interior; and one who is well acquainted with our familiar beverage, assures me that the effects are not unlike those produced by strong green tea, with this advantage in favor of the *Kât*, that the excitement is always of a pleasing and agreeable kind.‡

* *Bibliothéque Orientale*, La Haye. 1777. Tome 1, page 461, article *Cahuah*.

† The Arab writer seems here to distinguish *Kât* from *Cafta*, although they are previously spoken of as synonymous. Upon this De Sacy remarks, "Peut-être le *Kât* est-il la feuille même de cet arbre, et le *Cafta* une préparation artificielle faite avec cette feuille." *Chrestomathie Arabe*, Tome 1, pp. 462-3. Note 40.—D. H.

‡ Mr. Vaughan has transmitted two specimens called respectively *Subbare Kât* and *Muktaree Kât*, from the districts in which they are produced. The first named is considered of superior quality, the bundle sent which weighs nearly 2½ ounces, being worth at Aden two annas (3*d*. sterling.) The *Muktaree Kât* which consists of shorter shoots is not so much esteemed and consequently fetches a lower price.

Catha edulis Forsk. Nat. ord. *Celastraceæ*, is figured in Dr. Lindley's *Vegetable Kingdom* (Lond. 1846, 8vo.) page 586. But there is a still more complete representation of the plant under the name of *Catha Forskalii*, Richard, in a work published under the auspices of the French Government, and entitled *Voyage en Abyssinie exécuté pendant les années* 1839, 1840, 1841, 1842, 1843, *par une commission scientifique composée de MM. Théophile Lefebvre, Lieut., de vaisseau, A. Petit et Quartin-Dillon, docteurs-médecins, naturalistes du Museum, Vignaud, dessinateur*. The botanical portion of this work by M. Achille Richard, is regarded either as a part of the *Voyage en Abyssinie*, or as a distinct publication under the title of *Tentamen Floræ Abyssinicæ*. The leaves of the plant as represented by this author are somewhat narrower than those of the specimens received from Arabia.

M. Richard enters into some particulars relative to the synonyms of the plant, from which it appears that Vahl referred Forskål's genus *Catha* to the Linnean genus *Celastrus*, changing the name of *Catha edulis* for that of *Celastrus edulis*. Hochstetter applied the name of *Celastrus edulis* to an Abyssinian species (*Celastrus obscurus*, Richard) which he imagined identical with Forskål's *Catha edulis*, while of the real *Catha edulis*, Forsk., he formed a new genus and species, under the name of *Trigonotheca serrata*, Hochs., Nat. ord. *Hippocrateaceæ*.

WABEI a poisonous tree which grows in the Somali country on the Habber-Gerhajjis range of the Gooleis mountains, where it attains the height of twenty feet. The poison is obtained by boiling the root in water until the decoction attain the consistency of an inspissated juice. When cool, the barb of the arrow is anointed with the juice which is regarded as a virulent poison, rendering a wound tainted with it incurable.*—*Pharm. Journ.*, Dec., 1853.

(To be continued.)

PROCESS FOR DETERMINING THE VALUE OF SOAP.

By Dr. Bolley.

To determine the value of a specimen of soap, it is necessary to ascertain,—1st, the per-centage of dry substance; 2nd, the relative proportion of fatty acid and alkali; 3rd, the kind of alkali and fatty acid, or the substance replacing the latter; 4th, the intentional or accidental admixture of foreign organic or inorganic substances.

In most instances the consumer merely determines the per-centage of water in soap, because this is the most usual and almost unavoidable admixture, and one which, as is known, may be pre-

I quote the following references from the *Tentamen Floræ Abyssinicæ*, vol. i., p. 134:—

"*Catha Forskalii*, Nob., *Catha* No. 4, Forsk., loc. cit. [*Flor. Ægypt. Arab.*, p. 63.] *Trigonotheca serrata*. Hochs., in *pl.* Schimp. *Abyss.*, sect. ii., No. 649. *Celastrus edulis*. Vahl., *Eccl.*, i. 21."

Although in the *Flora Ægyptiaco-Arabica* of Forskäl, no specific name is applied to the *Catha* at p. 63, it is enumerated as *Catha edulis* at p. 107.

The reference to *Celastrus edulis* is not contained in the *Eclogæ Americanæ* of Vahl, but in that author's *Symbolæ Botanicæ* (Hauniæ, 1790, folio) pars. 1. p. 21.—D. H.

* Some dried branches of the *Wabei*, as well as a specimen of the root, have been forwarded by Mr. Vaughan. My friend Mr. Kippist after a careful examination, has expressed the opinion that the branches in question (which unfortunately bear neither flowers nor fruit) have the general aspect of those of a plant belonging to the nat. ord. *Apocyneæ*. Having searched in accordance with this suggestion, I find that *Carissa Schimperi*, Alph. De C. (Prod. viii. p. 675, bears an extremely close resemblance, so far as leaves and stem are concerned, to Mr. Vaughan's plant. *Carissa Schimperi* is described and figured by M. Richard in the *Tentamen Floræ Abyssinicæ*, vol. ii., p. 31., Atlas Tab. 68. It is synonymous with Hochstetter's *Strychnos Abyssinica*, with Schimper's specimens of which (*Sectio prima:* Plantæ Adoënses, No. 254) as contained in the herbarium of the British Museum and in that of my friend Mr. N. B. Ward, I find the *Wabei* very closely to agree.—D. H.

sent in a soap in considerable quantity, without in an equal degree influencing the exterior appearance, hardness, &c. The means of determining the per-centage of dry substance are,—1st, drying a weighed quantity in a water-bath; and 2nd, salting out, or introducing the soap into a saturated solution of chloride of sodium and boiling, by which means it concretes together into a solid mass tolerably free from water. With regard to the first method, many have no doubt found that when the soap has been heated for a long time in the water-bath, and has commenced to melt, it not only does not give off any more water, but becomes very hygroscopic, and attracts moisture again very rapidly.

Old Marseilles soap, exposed to a temperature of 86° F. for six hours, was found to have lost 3·2 per cent., and when kept at 212° F. for two hours, there was no further diminution in weight; after exposure to the air for a few hours, it weighed 1 per cent. more than at first. Several other specimens showed that soap, when heated to 212° F., increased in weight during the weighing. If such experiments were carried out by inexperienced persons, errors would be the natural consequence. The process of salting out may be applicable upon a somewhat large scale, with, for example, a pound of soap, and is then better adapted than the other to give trustworthy indication of the per-centage of actual soap. But the determination of dry soap has no bearing upon the very important question of the possible presence of adulterating substances, still less upon the second and third points mentioned above.

It is by no means difficult to determine the quantity of alkali and that of fat in a soap; but the operation is far more tedious and troublesome when it is at the same time requisite to ascertain whether the soap contains free alkali or fat, and the proportion of one or other to the fat and alkali in combination. Nevertheless this question may not generally be of great consequence, as both errors would scarcely be owing to a fraudulent intention, and their magnitude would be confined within a narrow limit. The uncombined alkali in hard (soda) soap may be determined by exposing the soap in fine shavings to the air, so that the alkali may absorb carbonic acid, treating it with strong alcohol, and examining the insoluble residue, which may contain other salts or insoluble substances, for alkali. A process recommended by Stockhardt is less troublesome; it consists in adding to a hot concentrated solution of soap, bitar-

trate of potash, until the fatty acids begin to separate. The larger the quantity of bitartrate requisite, the larger the quantity of free alkali. This is certainly a mere comparative test, applicable to the examination of a number of different specimens of soap. It is not improbable that unsaponified fat is sometimes present in soap. Dumas determines it by separating all the fat by means of hydrochloric acid, resaponifying with baryta-water, and extracting the baryta-soap with alcohol, which dissolves only the unsaponified fat.

The process now to be described does not take into consideration the quantity of free and combined fat or alkali, but includes the estimation of all the four above-named conditions which determine the value of a soap, and is at the same time serviceable and easily carried out.

A gramme of the soap is weighed; hard soap in shavings; soft soap is weighed to *near* a gramme, because the addition and abstraction of small quantities is more inconvenient than a reduction in the calculation. The soap is introduced into a beaker-glass holding about an ounce, treated with a small quantity of ether, in which it does not dissolve, and then with a rather smaller volume of pure acetic acid; two layers are thus formed; the soap is rapidly dissolved; the upper layer containing the ether and fat or resin, with a little acetic acid; the lower layer, water, alkali combined with acetic acid, free acetic acid, the salts usually formed in the manufacture of soap, chloride of sodium, alkaline sulphate, and finally the foreign admixtures, whether soluble in water or not. If sand, powdered pumice-stone, clay, steatite, heavy spar, &c., are present, they remain at the bottom of the glass. Other substances of organic origin, such as starch, &c., are suspended in the layer of liquid beneath the ether. The entire mass is then poured off from the undissolved substances in the beaker into a large pipette, widened in the middle and bent upwards at the lower extremity so as to form a kind of separator. The liquids are allowed to remain in the wide part of the pipette until they have perfectly separated into two layers, and it may then be so managed that none of the ethereal liquid enters its lower extremity, which is turned upwards. The beaker-glass, together with the residue, if any, is then washed with ether and water, which are poured into the pipette; and by inclining it, or blowing gently into the upper

end, the liquids may be partially separated. The addition of successive quantities of distilled water will then wash the ethereal liquid perfectly free from saline matters. This being effected, the ethereal solution of fat, together with the small quantity of water beneath it, are poured back into the empty beaker-glass, and the pipette is washed out with a mixture of strong alcohol and ether. A great advantage is thus gained, inasmuch as the small layer of water beneath the ether is rendered miscible with it by means of the alcohol; and if this is not the case at first, a few drops of alcohol must be added. It is for this reason advisable to avoid introducing too much water into the mixture when washing out the contents of the pipette into the beaker. It is also convenient to have the weight of the beaker marked upon it with a diamond. The ethereal liquid is then placed upon a water-bath, and left until nothing remeans but the fat or resin, which, without altering the general principle of the process, may readily be recognized. When a trace of aqueous liquid remains beneath the fat, it is very difficult to remove it by evaporation, and the addition of alcohol to the ether is a very appropriate means of obviating this difficulty. When the smell of ether, alcohol, and acetic acid has become very feeble, the residue is weighed, and the weighing repeated after a longer-continued application of heat; it rarely happens that any decrease of weight is perceived on the second weighing, when the evaporation is carried far enough in the first instance. When several experiments are made successively with the same soap, the percentage of fat comes out in the several determinations agreeing in the second decimal place.

The fatty acid from 1 grm. of soap forms a layer of such thickness, that by slightly inclining the beaker-glass, the bulb of a small thermometer can be introduced, so as to determine the melting-point, by which means some idea may be formed of the kind of fat. If any insoluble residue remains in the beaker after the first treatment of the soap, it is dried and weighed, and its nature determined. The aqueous liquid which is separated from the etherial solution of fat is introduced into a small capsule*, and carefully evaporated to dryness in a water-bath. The residue is

* A platinum or silver capsule, two inches in diameter, with a cover so that it can be used as an evaporating dish, or crucible, is the most convenient.

weighed, and ought not to suffer any further diminution of weight when again heated in the bath. The presence of gelatine may be detected during evaporation by the appearance, starch by means of iodine solution, cheese-curd by the peculiar empyreumatic odor evolved on the application of a sufficient heat; other substances may likewise be readily detected. Their total quantity is estimated by the loss of weight on ignition. If the perfect clearness of the aqueous liquid, the small residue left on evaporation, and its radiated crystalline appearance, indicate that saline substances only are present, the residue may be ignited at once and a previous weighing dispensed with. In this case the ash should contain very little carbon, and after this has been perfectly burnt off, it may be examined to determine the quantity and kind of mineral substances it contains. Silica, if it has been added in the gelatinous form, will have become insoluble, and may be separated by filtration and weighed. The filtrate must be examined for sulphate of potash and chloride of sodium, and their quantity determined when there is reason to suppose that they are greater than could be accounted for merely by the impurity of the alkali used in the manufacture of the soap, or the introduction of chloride of sodium during the process. In case it is unnecessary to determine the admixtures named, the total per-centage of alkali may be ascertained by treating the ignited residue with hydrochloric acid, evaporating to dryness, weighing, and calculating from the chloride of potassium or sodium the quantity of soda or potash. When it is necessary to ascertain whether besides soda there is potash present, or the reverse, this must be done according to the general rules of analysis, which it is not necessary to particularize here. The same remark applies to several other points. My object in the present instance is to furnish the chemist with a short method of ascertaining the value of soap, leaving the detailed execution of it to his own management.

For the usual purpose, then, this method enables us to determine the per-centage of fat* and its melting-point, the insoluble admixtures,—sand, heavy spar, pumice-stone, &c. The loss on ignition

* The per-centage of fat comes out somewhat higher than it really is, since the fatty acids are separated in the hydrated state, while in combination with potash and soda they are anhydrous. This circumstance is generally overlooked in the examination of soap, because the high equivalents of the fatty acids render its influence slight.

gives approximatively the organic admixtures. The saline residue, converted into chlorine compounds, indicates the per-centage of alkalies; in that from soda soaps, 58 parts are equal to 31 soda; and in potash soaps, 74 chloride of potassium are equal to 47 potash. The sum of these constituents (in centigrammes) deducted from 100 gives the per-centage of water.—*Chem. Gazette Feb.* 1, 1853.

ON A NEW SOURCE OF KINO.

By Robert Christison, M. D., V. P. R. S. E.
Professor of Materia Medica in the University of Edinburgh.

In a letter of the 20th of last July, from a merchant of Moulmein, Mr. R. S. Begbie, son of Dr. Begbie of this city, I was informed that a species of kino—which seemed to him to present the physical properties of the commercial variety of that drug in the English home market, and which had been ascertained by a medical friend at Moulmein to possess also its medicinal virtues—might be largely obtained from a tree abounding in the adjacent provinces. Mr. Begbie added, that he believed "a small quantity had been sent some years ago to England; but as an article of export generally it has not yet been shipped." This notice was accompanied by a small specimen, which is now produced, and which is large enough to allow of its principal properties being accurately ascertained.

As the inquiries I have made lead me to suppose that the article in question is of a very fine kind, and that the fact of its production near Moulmein, and probably over a considerable part of the neighboring province of Pegue, is not hitherto known in Europe, I beg to present to the Pharmaceutical Society the following description of it, and the reasons which induce me to think that it is obtained from the identical tree which yields in Malabar the present commercial kino of European trade.

The small portion sent by Mr. Begbie consists partly of little angular fragments; but there are several larger masses which are portions of cylinders, about half an inch in diameter, apparently moulded by collecting the juice in reeds. These have externally a grayish, striated surface, most unlike that of the broken fragments of commercial kino. They are easily frangible;

and the broken pieces have exactly the appearance of ordinary kino, except that they are even blacker, and more glassy by reflected light; and by transmitted light, though opaque when of very moderate thickness, they are of a splendid cherry-red color in very thin fragments. They are easily reduced to fine powder, which has a dark, dirty, lake tint. Their taste is very slightly bitter and intensely astringent.

Cold water acts more quickly on this kino than on the kino of commerce, gradually dissolving a very large proportion of it, and forming a deep cherry-red, astringent solution; and there is left a small proportion of greyish flocculent matter, which is slowly soluble in a great measure in boiling water, and which appears to be analogous to the insoluble variety of gum called bassorin. Boiling water dissolves this kino almost entirely, and the solution, when cold, continues nearly transparent for at least an hour; but afterwards it becomes slightly turbid, and a scanty, flocculent precipitate slowly subsides. Both the hot and cold solutions yield, when much diluted, a deep olive-green precipitate with the tincture of sesquichloride of iron; and when the solution is concentrated, a dirty grey precipitate is formed so abundantly that the whole fluid becomes a thick pulpy mass. A boiling solution in twenty-five parts of water forms with the iron test a pulp too thick to flow, which is one of the characters assigned in the Edinburgh Pharmacopœia to true officinal kino. But I find further that a solution in even seventy-five parts of cold water has a beautiful intense cherry-red color, and forms with sesquichloride of iron, in the course of an hour, a pulp so thick as to flow only sluggishly.

On comparing these characters with a fine specimen of kino of home trade, and also with a specimen collected in the neighborhood of Goomsoor, in Mysore, by Dr. Cleghorn, of the Madras Medical Service, when he was Surgeon of the surveying corps in that country, I find that the last two are identical, with the single exception that Dr. Cleghorn's specimen is somewhat redder when seen in bulk; and that the Moulmein kino is blacker, more vitreous in lustre, rather more easily soluble in cold water, and with rather less flaky residue; and when the cold solution is diluted to the strength of one in seventy-five, it requires rather more sesquichloride of iron to throw down all its tannin, and

consequently the precipitate forms with the water a somewhat firmer pulp.

This kino dissolves, with only a trace of flaky residue, in rectified spirit, which forms an intense cherry-red tincture of very pure astringent taste. The quantity in my possession is scarcely sufficient to allow of a fuller examination of its chemical properties and composition. But its physical characters, the action of water, and the properties of the watery solution, even as I have shortly indicated them, are enough to prove that the Moulmein kino is identical in nature with the present kino of home trade, and in point of quality somewhat superior. I have no doubt, from its taste, and the action of the iron test, that an analysis will prove the presence of a larger proportion of tannin.

It does not absolutely follow, even from the exact correspondences now mentioned, that the Moulmein kino is derived from the same botanical source with the present officinal kino of Europe. The officinal sort has been accurately referred by the separate researches of Dr. Gibson, Dr. Pereira, and Dr. Royle, to the *Pterocarpus Marsupium* of Roxburgh, a fine forest tree abounding in the hills of Mysore and other parts of the Indian Peninsula. But the *Butea frondosa* also yields a fine kino, which I have shown in my Dispensatory to be scarcely distinguishable in chemical properties from the officinal kind.

Mr. Begbie, however, has fortunately supplied me with a description of the Moulmein tree, sufficient to identify it with the true kino tree of Mysore. "It is," says he, "one of the commonest trees in the adjoining provinces, and is called by the Burmese *Padouk*. It grows to a great size and height. Immediately before the rainy season it is covered with long pendant yellow flowers, of an exceedingly sweet odor, like that of jessamine. The tree flowers three times, at intervals of perhaps a week or ten days; each blow lasting about twenty-four hours. The wood is in color like mahogany, and exceedingly heavy. It is used in India for making gun carriages; and at present we are preparing some for the London market, in execution of an order, I fancy, for the Royal Artillery. It makes most beautiful furniture. The gum exudes slightly without incision; but on a cut being made into the tree, it bleeds most freely." This description is not sufficiently botanical to enable me to determine

the tree from its characters in botanical works. But on submitting Mr. Begbie's letter to Dr. Gibson, Conservator of the Forests of Bombay, who very lately visited Edinburgh, that gentleman at once recognized his old acquaintance of the Indian woods, the *Pterocarpus Marsupium;* which he was one of the first to discover to be the true source of kino, by observing that, when his companions on a shooting party cut their names into the bark of a tree beside which they had been resting, a red juice freely exuded, and concreted into a dark astringent gum, like the kino of commerce.—*Pharm. Journ.*, Feb., 1853.

CHEMICAL EXAMINATION OF THE RUBIACEÆ.

By F. Rochleder.

The author has devoted himself for several years to the examination of a single family of plants. The results of these investigations have confirmed the fact already frequently stated, that the same or similar substances are very often produced in allied plants, and undergo similar transformations in their economy. He has now put together the following general results of his experiments upon some of the most interesting plants of the family *Rubiaceæ*.

1. The beans of *Coffea arabica* contain, besides some sugar, fatty matter and legumine, caffeotannic, viridic and citric acids and caffeine.

2. In the root of *Cephaëlis ipecacuanha* there are ipecacuanhic and pectic acids, gum, starch, and some fatty matter and emetine.

3. In the root of *Chiococca racemosa*, caffeotannic and caincic acids and emetine (?) are met with.

4. In the bark of *Portlandia grandiflora* (*China nova Xauxa*,) chinovatannic acid, chinova-red, gum, kinic and kinovic acids are contained.

5. The bark of *Cinchona scrobiculata* contains cinchonatannic acid, cinchona-red, kinic acid, kinovic acid, cinchonine, cinchotine and quinine.

6. The herb of *Asperula odorata* contains aspertannic, rubichloric and citric acids, coumarine and catechine.

7. The herb of *Rubia tinctorum* contains rubitannic, citric and rubichloric acids.

8. In the root of *Rubia tinctorum* there are present rubichloric, citric, ruberythric and pectic acids, alizarine, purpurine and sugar.

9. In the herb of *Galium verum*, galitannic, rubichloric, and citric acids are found. The two latter substances also exist, together with small quantities of tannic acid, in *Galium aparine.*

Pectic acid has only been found in the roots of two plants, the *Cephaëlis ipecacuanha* and *Rubia tinctorum ;* it cannot therefore be considered as a characteristic constituent of the plants belonging to the family *Rubiaceæ.* The same is the case with coumarine, which could only be discovered in the herb of *Asperula odorata.*

The same must be said of the organic bases. Bases are contained in four plants,—in *Cephaëlis ipecacuanha* (root,) *Chiococca racemosa* (root,) *Coffea arabica* (seed) and *Cinchona scrobiculata* (bark.) In the other plants no organic bases could be detected. All the plants of this family which were examined contained an acid, the aqueous solution of which,—

a, is colored dark green by perchloride of iron ;

b, becomes brown on the addition of potash, by absorbing oxygen from the air ;

c. The acid contains 14 equivs. of carbon and 8 equivs. of hydrogen, with a quantity of oxygen varying from 6 to 10 equivs.

d. All these acids, as far as they have been examined with this view, are decomposed by the action of acids, alkalies and oxygen, or heat, and furnish, with the loss of 2 equivs. of carbon and 2 equivs. of hydrogen, a product of decomposition containing 6 equivs. of hydrogen to 12 of carbon. The oxygen in these products amounts to 5 or 6 equivs.

These acids form a continuous series ; they are here placed one below the other, proceeding from the poorest to the richest in oxygen. Some of them possess different properties with the same composition :—

Ipecacuanhic acid $=C^{14}H^{8}O^{6}$, in the root of *Cephaëlis ipecacuanha.*

Caffeotannic acid $=C^{14}H^{8}O^{7}$, in the berries of *Coffea arabica* and the root of *Chiococca racemosa.*

Chinovatannic acid $=C^{14}H^{8}O^{7}$, in the bark of *Portlandia grandiflora.*

Aspertannic acid $=C^{14}H^{8}O^{8}$, in the herb of *Asperula odorata.*

Rubitannic acid $=C^{14}H^{8}O^{9}$, in the herb of *Rubia tinctorum.*
Cinchonatannic acid $=C^{14}H^{8}O^{9}$, in the bark of *Cinchona scrobiculata.*
Galitannic acid $=C^{14}H^{6}O^{10}$(?), in the herb of *Galium verum.*

The caffeotannic acid is resolved, at an elevated temperature, into pyrocatechine, $C^{12}H^{6}O^{4}$, carbon and water. By the action of the oxygen of the air in the presence of potash, $C^{12}H^{6}O^{5}$ is found.

The chinovatannic acid is decomposed by the action of acids into sugar and chinova-red $=C^{12}H^{6}O^{5}$.

The aspertannic acid, by treatment with acids, gives a body of the composition $C^{12}H^{6}O^{6}$.

The cinchonatannic acid, by decomposition in the air, produces cinchona-red, $C^{12}H^{7}O^{7}=C^{12}H^{6}O^{6}+HO$.

The tannic acids of the *Galium verum* and *aparine* and of the leaves of *Rubia tinctorum* are contained in these plants in such small quantities, that it was impossible, even by operating upon large quantities of them, to procure sufficient material for the examination of the products of their decomposition. The ipecacuanhic acid also has not yet been examined in this respect.

From what has been here stated, it follows that all the plants of the family *Rubiaceæ* that have been investigated contain a tannic acid of the general formula $C^{14}H^{8}O^{n}$. Taking into consideration the mode of decompositon of these substances, this formula may be

written $\left.\begin{matrix}C^{12}H^{6}\\C^{2}H^{2}\end{matrix}\right\}O^{n}$.

All the *Rubiaceæ* belonging to the division *Stellatæ*, which were investigated, contained, together with the characteristic tannic acids, in all the parts which were examined, rubichloric and citric acids. Rubichloric acid, according to its composition, is immediately allied to these tannic acids; it contains carbon and hydrogen in the same proportion. Its formula is $C^{14}H^{8}O^{9}$; it is decomposed by the action of acids at a high temperature into formic acid and chlorrubine, so that its formula may be written thus:—$\left.\begin{matrix}C^{12}H^{6}\\C^{2}H^{2}\end{matrix}\right\}O^{9}$. In its properties, however, it differs completely from the tannic acids; it is not colored green by perchloride of iron, &c.

Citric acid must be considered as a characteristic constituent of

the *Stellatæ*, for the same reason that the rubichloric acid is a characteristic constituent of this group. If the hydrate of citric acid be written $=C^{12}H^6+O^{12}$, it represents a member of the formula $\left.\begin{matrix}C^{12}H^6\\C^2H^2\end{matrix}\right\}O^n$.

Just as the *Stellatæ*, together with the characteristic tannic acids of the formula $\left.\begin{matrix}C^{12}H^6\\C^2H^2\end{matrix}\right\}O^n$, contain the rubichloric and citric acids, analogous in their composition, but differing in their properties, so in the *Cinchonaceæ* the tannic acids are accompanied by kinic and kinovic acids. The kinic acid, $C^{14}H^8O^8$, like the rubichloric acid, is nearly allied in its composition to the tannic acid of all *Rubiaceæ*, of the formula $C^{14}H^8O^n$, but like it also differs from them in all its reactions. The place of the citric acid of the *Stellatæ* is occupied in this group by an acid, which, like citric acid, contains 12 atoms of carbon; its formula is $C^{12}H^9O^3$.

In the true *Coffeaceæ*, *Cephaëlis ipecacuanha*, *Coffea arabica* and *Chiococca racemosa*, no common characteristic substance accompanies the tannic acids. In the seeds of *Coffea arabica*, the citric acid of the *Stellatæ* is present, although in inconsiderable quantity; the kinovic acid of the *Cinchonaceæ*, combined with hydrate of carbon, is contained in the root of *Chiococca racemosa* in the form of *caincic acid*. In the root of *Cephaëlis ipecacuanha* both acids are wanting. The large quantity of starch and gum, which partake of the formula $C^{12}H^{10}O^{10}$, contained in this plant, is perhaps to be regarded as the representative of the citric acid. Citric acid (anhydrous) with 2 additional equivs. of water $=C^{12}H^7O^{13}$, is starch or gum in which 3 equivs. of hydrogen are replaced by 3 equivs. of oxygen.

If the plants of these three groups be brought together with their characteristic constituents, the following tabular view is obtained:—

RUBIACEÆ.

I. *Stellatæ*.

I. Characteristic constituent.	II. Characteristic constituent.	III. Characteristic constituent.
Tannic acid of the formula— $\left.\begin{matrix}C^{12}H^6\\C^2H^2\end{matrix}\right\}O^n$. n=8, 9 or 10.	Rubichloric acid— $\left.\begin{matrix}C^{12}H^6\\C^2H^2\end{matrix}\right\}O^9$.	Citric acid— $C^{12}H^6O^{12}$.

II. *Cinchonaceæ.*

I. Characteristic constituent.	II. Characteristic constituent.	III. Characteristic constituent.
Tannic acid of the formula— $\left.\begin{matrix}C^{12}H^{6}\\C^{2}H^{2}\end{matrix}\right\}O^{n}$. n=7 or 9.	Kinic acid— $\left.\begin{matrix}C^{12}H^{6}\\C^{2}H^{2}\end{matrix}\right\}O^{8}$.	Kinovic acid— $C^{12}H^{9}O^{2}$.

III. *Coffeaceæ.*

I. Characteristic constituent.	II. Characteristic constituent.	III. Characteristic constituent.
Tannic acid of the formula— $\left.\begin{matrix}C^{12}H^{6}\\C^{2}H^{2}\end{matrix}\right\}O^{n}$. n=6 or 7.	Wanting.	Citric acid $=C^{12}H^{5}O^{12}$, or Kinovic acid $=C^{12}H^{9}O^{3}$, or Gum and starch $=C^{12}H^{10}O^{10}$.

As regards the quantity of the characteristic tannic acids existing in the different groups, the largest quantity is found in the *Coffeaceæ* and *Cinchonaceæ*, although for the most part already changed by the influences to which the parts of the plants have been exposed before they reach us. In the *Stellatæ* the quantity of these acids is very small, especially in *Galium aparine* and the leaves of *Rubia tinctorum*.

If these tannic acids be considered with regard to their amount of oxygen, it appears that this is greatest in those plants which inhabit the temperate zones, such as the *Stellatæ*, or which grow at greater elevations, like the Cinchonæ, which flourish on the Andes at from 4000 to 8000 feet above the level of the sea; whilst it is small in the tannic acids of plants inhabiting hot climates, such as *Cephaëlis ipecacuanha*, *Coffea arabica* and *Chiococca racemosa*. While the tannic acids of the *Stellatæ* contain 8.10 equivs. of oxygen, those of the true *Coffeaceæ* have only 6.7 equivs.; so that the deoxidation goes further in high temperatures than in colder climates.

With regard to those plants, which, together with a tannic acid, contain also an acid of the formula $C^{14}H^{8}O^{n}$, it appears that they only differ in their composition by 1 equiv. of oxygen, so that by the separation of 1 equiv. of oxygen, the one acid might pass into the other. Their different properties and mode of decomposition sufficiently show that they are not to be considered as different oxides of the same radical. The author here compares together the acids which are contained in the same plant.

The tannic acid in *Portlandia grandiflora*, $C^{14}H^8O^7$, may be formed from the kinic acid, $C^{14}H^8O^8$, by the loss of 1 equiv. of oxygen; as may the kinic acid, $C^{14}H^8O^8$, of the *Cinchona scrobiculata* from its cinchonatannic acid, $C^{14}H^8O^9$; the aspertannic acid, $C^{14}H^8O^8$, of the *Asperula odorata* from its rubichloric acid, $C^{14}H^8O^9$; and the rubichloric acid, $C^{14}H^8O^9$, of the *Galium verum* from its galitannic acid, $C^{14}H^8O^{10}$.

The rubitannic acid of the *Rubia tinctorum* may pass directly into the isomeric rubichloric acid. The occurrence of acids with 12 equivs. of carbon, such as citric and kinovic acids, together with acids of the formula $C^{14}H^8O^n$, as well as, on the other hand, the readiness with which the acids containing 14 equivs. of carbon pass into substances with 12 equivs. of carbon, appears to render it probable that these acids with 12 equivs. of carbon are the materials from which the acids with 14 equivs. are formed, although hitherto no one has succeeded in forming a tannic acid from citric or kinovic acid.

If the hydrate of citric acid, $C^{12}H^6O^{12}$, were to assimilate 1 equiv. of formic acid and give off oxygen, the formation of the tannic acids of the *Rubiaceæ* might be effected,—Citric acid = $C^{12}H^6O^{12} + C^2H^2O^4$, formic acid = $C^{14}H^8O^{16}$.

$C^{14}H^8O^{16} - O^6 = C^{14}H^8O^{10}$, the tannic acid of *Galium verum*.

$C^{14}H^8O^{16} - O^7 = C^{14}H^8O^9$, the rubichloric acid of the *Stellatæ*, or the tannic acids of the cinchona bark and of the *Rubia tinctorum*.

$C^{14}H^8O^{16} - O^8 = C^{14}H^8O^8$, the kinic acid of the *Cinchonaceæ*, or the tannic acid of *Asperula*.

$C^{14}H^8O^{16} - O^9 = C^{14}H^8O^7$, caffeotannic acid, or the tannic acid of the *Cinchona nova* bark.

$C^{14}H^8O^{16} - O^{10} = C^{14}H^8O^6$, the tannic acid of the *Ipecacuanha* root.

In this manner the kinovic acid, $C^{12}H^9O^3$, might be transformed into these acids by the assimilation of oxalic acid and oxygen, $C^{12}H^9O^3 + C^2O^3 = C^{14}H^9O^6$. If 1 equiv. of water be separated, there remains $C^4H^8O^5$, which united with 1 equiv. oxygen might form ipecacuanhic acid, with two equivs., the caffeotannic acid, and so on.

That kinovic acid is capable of assimilating other compounds is shown by the investigation of caincic acid, which consists of

kinovic acid united with a hydrate of carbon, which has the constitution of acetic acid.

$C^{16}H^{13}O^{7}$, caincic acid $= C^{12}H^{9}O^{3}_{2}$, kinovic acid $+ C^{4}H^{4}O^{4}$.

Rubichloric acid, and its separation into chlorrubine and formic acid, is a proof that a process like that above mentioned really takes place in the plants. Citric acid $= C^{2}H^{6}O^{12}$, loses 7 equivs. of oxygen and passes into $C^{12}H^{6}O^{5}$, which, united with the elements of formic acid, produces rubichloric acid.

$C^{14}H^{8}O^{9}$, rubichloric acid $= C^{12}H^{6}O^{12}$, citric acid $-O^{7} + C^{2}H^{2}O^{4}$, formic acid.

At a low temperature the deoxidation of the citric acid appears to take place very imperfectly. The herb of *Richardsonia scabra* which was cultivated last summer by Prof. Kosteletzky in the Botanic Garden of Vienna, contained inconsiderable quantities of tannic acid, whilst not a trace appeared in the roots; both herb and root, on the other hand, were rich in citric acid salts. In its native country, the root of the *Richardsonia scabra* contains tannic acid.

The author here adds some considerations on the origin of the hydrates of carbon, and particularly on the question from what substances they are produced. The fact that plants possess the faculty of separating oxygen by the agency of the sun light, after they have absorbed carbonic acid and water, induced Liebig to suppose that the hydrates of carbon were formed from acids. The absorption of carbonic acid and water and the elimination of oxygen take place by degrees, and thus from compounds rich in oxygen, but poor in carbon and hydrogen, constituents are gradually formed, always richer in carbon and poorer in oxygen.

The author considers the result of his investigations as supporting Liebig's view, for it proves that the external resemblance in the form of the plant corresponds also constantly with the acids combined with various bases in its interior. It is also in favor of this supposition that the hydrates of carbon are really formed by the process of deoxidation in the plants, that acids occur in the same plant, which with the same amount of carbon and hydrogen are distinguished from one another by containing a larger or smaller quantity of oxygen. Although these acids cannot be regarded as different oxides of one radical, it appears to the author to be extremely probable that they may arise from the

deoxidation of one another.—*Chem. Gaz.*, Aug. 2, 1852, from *Bericht der Akad. der Wissensch. zu Wien Math. Phys. Cl.*, Jan. 1852.

ON THE ADULTERATION OF AMERICAN LARD IN ENGLAND.

By F. Grace Calvert, Esq.

[In a short communication read at the meeting of the Pharmaceutical Society, Dec. 8th, 1852, Mr. George Whipple states "That he had for some time past suspected the purity of commercial lard, and had recently made a few experiments which led to the detection of large quantities of some farinaceous substance in it. This adulteration was discovered in the different varieties of lard—from the finest bladder to the common firkin lard. In an examination of the contents of two firkins weighing 105½ lbs., a quantity of farinaceous substance, amounting to 22¼ lbs., was separated. The contents of another firkin, weighing 43¾ lbs., yielded 12¾ lbs. of a similar substance. Mr. Whipple points out the pernicious effects which this adulteration would be likely to produce in the employment of such lard for some pharmaceutical purposes, and the danger which might ensue from its application to machinery." By the following observations of Mr. Calvert, this adulteration is effected in England, and as the presence of the starchy matter is easily detected with iodine water, it will be well to have a care that the adulteration is not practiced here without detection.—Ed. Am. Journ. Pharm.]

During the numerous analyses I made some three years since of various articles of food employed in public establishments, I analysed several samples of American lard, and therefore may add to the fact already mentioned by Mr. George Whipple in your last number, that I found them to contain, in addition to starch, from 10 to 12 per cent. of water, and from 2 to 3 per cent. of alum, and about one per cent. of quick lime.

A few months ago I was able to ascertain that the operation is conducted in the following manner:

The fatty matters, such as they arrive from America, are melted with a little water in false-bottomed copper pans, through which circulates a current of steam. The dirt and other hetorogeneous matters fall to the bottom of the pans, and the clear grease is allowed to run into a wooden vessel, when it is stirred in contact with cold water; it is then put under revolving wheels, with a thick paste made of potato starch, mixed with a little

potash, alum and quick lime, which appears to facilitate the taking up of the water and starch by the fatty matter.

The cause of the American lard appearing so white, is no doubt the great division of the fatty matter through the interposition of the starch, water, and alumina.

The quantity of alum should be such that a small excess should remain to prevent the starch from becoming mildewed, and I believe that the manufacturer also adds it for the purpose of communicating to the lard the property of facilitating the raising and increasing the whiteness of the confectioners' paste, in which it is employed largely.

Royal Institution, Manchester, January 17*th*, 1853.

ON RACEMIC ACID.

The doubts which hitherto have existed relative to the formation of racemic acid, have at length been completely removed by the recent researches of M. Pasteur.

It was somewhere about the year 1820, that M. Kestner of Thann, in the department of Vogdes, France, a manufacturer of tartaric acid, first noticed the existence of racemic acid; and having met with it whilst employing tartar, obtained from the grapes grown in his department, he came to the conclusion that it existed ready formed in the tartar thus obtained. Instead, however, of this acid continuing to appear as a regular product in his manufactory, M. Kestner found that after a few years it ceased to appear altogether. During the period in which racemic acid was obtained by him in the regular course of his manufacture, M. Kestner was in the habit of decomposing his crude tartars by means of carbonate of lime, using a large excess of sulphuric acid in the decomposition of the tartrate of lime, and passing a current of chlorine gas through the tartaric acid solution, for the purpose of removing its color. Subsequently, he modified his process of making tartaric acid, and was accustomed to decompose the tartar by caustic lime, using a slight excess only of sulphuric acid in the decomposition of the tartrate of lime, and omitting altogether the bleaching process.

It appears that Mr. White, of Glasgow, also a manufacturer of tartaric acid, had noticed in his manufactory a product differing

from tartaric acid, and which he took to be racemic acid. In a letter to M. Pelouze, Mr. White stated also that the tartars he had been in the habit of employing were imported from Naples, Sicily, and Oporto. M. Kestner, when informed of this circumstance by M. Pelouze, remembered that he had also used some tartars, the produce of Italy, at the time of his obtaining racemic acid. About the same time, also, it was found that large quantities of racemic acid were met with in commerce in England, although this product was quite unknown in the English manufactories of tartaric acid. On investigating the subject, it was found that this racemic acid came from some German manufacturers.

About the month of August last, M. Mitscherlich apprised M. Pasteur that M. Fikentscher, a skilful manufacturer in Saxony, prepared racemic acid, and had supplied him with some. In consequence of this information, M. Pasteur went to M. Fikentscher's manufactory, and learned from him that this acid was regularly produced in his manufactory, but that the quantity obtained had very much fallen off since his employment of tartars imported from Trieste. In fact, since M. Pasteur's visit, the quantity produced was so small as at last to be quite lost sight of altogether. In operating on Neapolitan tartars, the needle-shaped crystals of racemic acid were scarcely discernible, on account of the smallness of their quantity, amidst the large masses of tartaric acid contained in the crystallizing vessels. In addition, these small crystals of racemic acid did not make their appearance in the first crops of crystals, and but in small quantities in subsequent crystallizations; whence we see that this acid is but extremely little soluble in a concentrated solution of tartaric acid.

Knowing that M. Kestner formerly obtained racemic acid in such quantities as to be able to sell it by the hundred-weight, M. Pasteur was much surprised at the smallness of the quantity produced at M. Fikentscher's manufactory; it struck him, however, that the difference might be accounted for in the circumstance, that whilst M. Kestner employed the rough, unrefined tartars, M. Fikentscher used those which had been partially refined, and it appeared clear to M. Pasteur, that if racemic acid existed ready formed in the tartars, the principal portion of it would be remaining in the mother liquors of the refinery, whatever might be its condition in

the crude tartar. The racemate of lime itself is, indeed, but little soluble in bitartrate of potash.

Having been informed by M. Fikentscher that there were extensive refineries of tartar at Trieste and at Venice, M. Pasteur started for those places, with a view to examine the mother liquors of the refineries; but whilst stopping at Vienna to visit some manufactories of tartaric acid, the question as to the origin of racemic acid became so clear to his mind, that he at once decided on considering it as a purely natural product. In the course of his visits to several tartaric acid manufactories, in company with M. Redtenbacher, he at first thought that no appearance of racemic acid presented itself, but on examining the different qualities of tartaric acid in the stores of M. Nach, he soon recognized the small crystals of racemic acid present; the quantity, however, was so small, that it took more than three hours to collect a few decigrammes. It has previously been supposed that, as M. Nach decomposed the tartrate of potash by means of sulphate of lime, these crystals were sulphate of potash. A circumstance, however, which militated against this supposition was, that it was only within about a year that these needle-shaped crystals had made their appearance in his manufactory, and that it was only during the last two years that M. Nach had employed the crude Austrian tartars. When partially refined tartars had been used, no racemic acid showed itself. Hence M. Pasteur concluded:—

1. That the crude Austrian tartars contain racemic acid ready formed; for it is evident that, if this acid were an artificial production, it would always make its appearance in the same manufactory, the mode of operating in which was not changed, but in which the quality only of the tartars used had varied.

2. That the crude Austrian tartars should contain this acid in less quantity than the crude Neapolitan tartars, since the latter, when partially refined, still furnish some racemic acid, and that, too, when the liquors are comparatively new.

Besides, as the mother liquors remained upwards of one year before giving indications of racemic acid, this acid does not appear until it has been accumulated by successive operations, which have gradually concentrated into a small compass the acid contained in a large quantity of tartar; the mother liquors of one being used in the treatment of new crude tartar. This result was

confirmed by the fact, that, in a manufactory which had been but a few months in work, no appearance of racemic acid had manifested itself, although crude Austrian tartars were employed. Lastly, the preceding conclusions were confirmed by facts of the same kind elicited in the manufactory of M. Seybel, in which the employment of partially refined tartars had for the last two or three years been discontinued, and last winter the small crystals of racemic acid made their appearance, which were at first supposed to have arisen from some impurity in the crude tartars employed.

It must be noticed that the tartars employed in M. Seybel's manufactory were obtained from Hungary and Styria, proving that the crude tartars of those countries contained racemic acid, as well as those of Austria and Naples.

On his return to France, M. Pasteur communicated these facts to M. Kestner, and assisted him in his endeavors to reproduce the mysterious acid which for thirty years had eluded his researches. For this purpose, M. Kestner has ordered crude Neapolitan tartars, and also some of the mother liquors of the tartar refineries evaporated to dryness, which he intends operating upon as crude tartars. In addition to this, M. Kestner has introduced into his regular course of manufacture the crude tartars of Tuscany, and has already, in the third crystallization, obtained racemic acid, thus furnishing a new proof that this acid is a natural product, and that the crude tartars of Italy do contain an appreciable quantity of it.

M. Redtenbacher has since written to M. Pasteur, to the effect that M. Seybel, on converting the mother liquors of his manufactory, which had been accumulating for three years, into tartrate of lime, had decomposed a portion of that salt, and that the acid liquor obtained yielded several kilogrammes of racemic acid. The quantity of liquor undergoing crystallization was about 1,400 kilogrammes (28 cwt.) This result coincides with that obtained by M. Kestner, whilst working up the mother liquors of an old manufactory, in which the tartars of Saintonge had been employed. These mother liquors had been purchased by M. Kestner, and having noticed the presence of racemic acid, he worked them up by themselves, converting them into tartrate of lime, and proceeding in the usual way to manufacture tartaric acid. The tartrate of lime thus obtained, yielded about one per cent. of racemic acid. Hence M. Kestner concludes that the tartars of France, at least

certain parts, contain racemic acid, as well as those of Italy, Austria, and Hungary, and that this acid accumulates in the mother liquors of tartaric acid manufactories.

M. Kestner presented, through M. Biot, to the Paris Academy of Sciences, January 3, about nine pounds of the racemic acid so obtained, on which occasion the facts contained in this notice were communicated to the Academy.

In a notice of paratartaric (racemic) acid, which appeared in the *Pharmaceutical Journal*, of February, 1851, the author of the paper states, that "recent investigations, have led to the conclusion that most tartars contain a certain portion of this acid, which is lost in the process at present employed in the manufacture of tartaric acid. This fact may serve to account for the deficient results sometimes obtained."—*Ann. of Pharm.* Feb., 1853.

ANALYSIS OF OILS BY MEANS OF SULPHURIC ACID.

By Maumene.

When fixed oils are mixed with sulphuric acid, they evolve heat. This reaction can be employed to distinguish the drying oils from those which do not possess this property.

Olive Oil.—Into an ordinary test glass, 50 grms. of the oil are poured; a thermometer is placed therein, and 10 cub. cent. of boiled sulphuric acid are carefully added. The temperature of the acid and oil was 77° Fahr. After being mixed, the temperature had risen to 153°. The elevation of temperature in repeated experiments is constant, that is, 76°. The mixture is made within two minutes, and the temperature has within one minute reached its maximum. It evolves no sulphuric acid.

Rape Oil.—Oil and acid had 79°. After being mixed, the thermometer rose to 213°. Elevation of temperature 134°. The mixture swelled, and evolved sulphurous acid. With this oil, the elevation of temperature is also constant, but the true elevation amounts to 155°. The difference of the observed and the true temperatures is caused by the loss of heat which the mixture suffers by the evolution of the sulphurous acid gas.

Ben Oil and Tallow Oil exhibit very nearly the same elevation of temperature as olive oil.

Drying Oils heat much more strongly with sulphuric acid than the non-drying ones, and can be thereby distinguished from them. Thus, when olive oil at 77° exhibits a greater elevation of temperature than 76°, it is adulterated with other oils.—*Annals of Pharm, from Comptes Rendus.*

ON THE COLORING MATTER OF VOLATILE OILS.

By G. E. Sachsse.

It is well known that most ethereal oils are colorless; however, there are a great number colored, some of which are blue, some green and some yellow. Up to the present time the question has not been decided, whether it is the necessary property of ethereal oils to have a color, or whether their color is not due to the presence of some coloring matter which can be removed. It is most probable that their color arises from the presence of a foreign substance, as the colored ethereal oils can at first, by careful distillation, be obtained colorless, whilst later the colored portion passes over. Subsequent appearances lead to the solution of the question, and are certain evidence that ethereal oils, when they are colored, owe their color to peculiar substances which, by certain conditions, may be communicated from one oil to another. When a mixture of oils of wormwood, lemons, and cloves is subjected to distillation, the previously green-colored oil of wormwood passes over, at the commencement, colorless, while, towards the end of the distillation, after the receiver has been frequently charged, the oil of cloves distils over in very dense drops of a dark green color. It therefore appears that the green coloring matter of the oil of wormwood has been transferred to the oil of cloves.—*Ibid, from Zeitschrift für Pharmacie.*

APPLICATION OF ELECTRICITY AND OZONE IN THE MANUFACTURE OF SULPHURIC ACID.

The *Pharmaceutical Journal*, for March, contains the specification of a patent granted to Thomas Bell, of South Shields, and enrolled December 24th, 1852. It consists, firstly, in applying currents of electricity in the sulphuric acid chambers for the purpose of promoting the union of oxygen and sulphurous acid,

and thus avoiding the necessity of using nitre; and, secondly, in obtaining and applying streams of ozone to act on sulphurous acid in the same way.

The inventor prefers to employ electricity derived from jets of steam, but does not confine himself to such. He uses an ordinary sulphuric acid chamber, and in place of, or in addition to, the use of nitre or nitric acid as heretofore, he applies electric currents. He uses for a full sized chamber, twenty-four jets of steam (of 50 lbs. pressure in the boiler,) passing through passages of about a quarter of an inch in diameter, and opposite each jet a collecter consisting of numerous small points connected with an iron rod, three-quarters of an inch thick, which communicates with, and enters a glass tube, through which the sulphurous acid flows into the chamber, so that the electricity will pass into the chamber with the sulphurous acid, and convert it into sulphuric acid. The inventor finds an advantage from generating a part of the electricity from jets of steam within the chamber, but when all that is requisite is thus obtained, the resulting acid is too dilute.

The patentee does not claim to have discovered the fact that ozone is capable of converting sulphurous acid into sulphuric acid, but in arranging apparatus in such a manner that ozone and sulphurous acid may be continuously produced, and the sulphurous acid converted into sulphuric acid. He employs an ordinary sulphuric acid chamber, kept at a temperature between 60° and 70° Fahr., which is most favorable for the action of the ozone, and conducts into it a continuous current of sulphurous acid, and another of ozone, derived from the following described arrangement, viz:—

The ozone generators consist of chambers of iron or earthen ware, 16½ inches wide, 12 inches deep, and 26 inches high, with a tube 4½ inches in diameter, opening from the top into the acid chamber. Each box has two holes, about eight inches from the bottom, three-eighths of an inch in diameter, and a tray or draw arranged so as to slide into an opening near the bottom, in which is placed twelve sticks of phosphorus, seven inches long and three-eighths of an inch in diameter, immersed in water to one-half of their diameter. For a chamber 200 feet × 19 × 16 feet, the patentee employs twelve such boxes, the phosphorus being replaced by fresh sticks every twelve hours, unless it inflames, in

which case the change is made earlier. The sticks of phosphorus are removed before being used a second time.

The patentee believes it will be found advantageous to pass the sulphurous acid and ozone into a column filled with coke, pumice-stone, or other suitable material, before they pass into the sulphuric acid chamber. He obtains the sulphurous acid by burning sulphur in the ordinary way.

THE QUALITATIVE AND QUANTITATIVE DETERMINATION OF IODINE, AND ITS SEPARATION FROM BROMINE AND CHLORINE BY MEANS OF BENZINE AND NITRATE OF SILVER.

By E. Moride.

Benzine possesses the property of dissolving iodine wherever it meets with it in a free state. The color produced by this solution is bright red, which becomes deeper in proportion to the amount of iodine contained in it. When exposed to the air, the iodine is volatilized, and the solution becomes discolored.

If a few drops of nitrous acid be put into a liquid containing an alkaline iodide, and after the mixture is effected 2 or 3 grms. of benzine be added to it, and the whole strongly agitated, the benzine soon rises to the surface of the liquid, exhibiting a magnificent color, arising from the iodine which it brings with it. This reaction renders it possible to determine with the greatest ease the presence of 1 milligrm, of iodine in 5 litres of water. Neither ether nor the oils of lavender, citron or turpentine, furnish under similar circumstances such decisive results.

Chloroform, employed either in M. Rabourdin's method or in that of M. Grange, certainly in many cases readily shows the presence of iodine; but its sensibility and the color which it acquires are far from being so conclusive as the characters offered by benzine. In carefully conducted experiments, I have been able in this way to determine the presence of iodine wherever traces of it were indicated by starch-paste, and the employment of benzine has always appeared to me to furnish most satisfactory results.

I will add to these observations, that if by means of benzine we can separate extremely small quantities of iodine from water, it is also very easy to determine these quantities by nitrate of silver or metallic mercury.

Thus, after washing the iodized benzine repeatedly in distilled water, I take it up in a pipette, and introduce it into a corked tube, in which I agitate it in contact with a few drops of a solution of nitrate of silver or with a known quantity of mercury, until the liquid is completely decolorized.

In the first case, the yellow precipitate of iodide of silver is washed with alcohol of 0.86 spec. grav., thrown on a filter, and treated like chloride of silver which it is intended to weigh.

In the second, the mercury is shaken with the iodized solution, and the augmentation of its weight determined. These results may be checked by dissolving the protiodide of mercury formed in an excess of iodide of potassium.

Bromine, and bromides to which dilute nitric, nitrous or muriatic acids have been added, do not communicate any color to benzine; the same is the case with chlorine and chlorides. The bromine and chlorine remain dissolved in the water which serves to wash the benzine; they may be separated in the form of a white precipitate by nitrate of silver. Benzine, taking up iodine without possessing the property of dissolving either bromine or chlorine, enables us therefore to separate iodine perfectly from those two bodies, and to prove in a precise manner the presence of chlorides or bromides in commercial iodide of potassium.—*Chem. Gaz.*, Feb. 15, 1853, from *Comptes Rendus*, Nov. 29, 1852.

ON THE PREPARATION OF GALLIC ACID FROM CHINESE GALL-NUTS.

By Dr. G. C. Wittstein.

The low price of Chinese gall-nuts and the larger quantity of tannic acid which they contain, induced the author to employ them as a source of gallic acid. Having found as the result of repeated trials that of the two methods of preparation, viz., precipitating the aqueous decoction with sulphuric or hydrochloric acid, or allowing the powdered gall-nuts made into a paste with water to undergo a species of fermentation, the latter furnished a much larger product, he adopted this method, notwithstanding the length of time it requires. The first result was, however, unfavorable. At the end of six weeks he found that the mass had still a very astringent taste, the filtered liquid gave a copious precipitate with

gelatine, and no crystals were formed on evaporation. The mass was therefore boiled with water and the clear liquor precipitated by sulphuric acid, by which means the gall-nuts yielded barely one-sixth of their weight of rather colored gallic acid.

The author then refers to Strecker's researches, which have shown that tannic acid is a conjugate compound of gallic acid and sugar, and consequently that the production of the latter acid in a paste of gall-nuts and water is caused by a nitrogenous substance contained in them, which acts the part of a ferment and determines the breaking-up of the sugar into certain products, at the same time liberating the gallic acid. He is further of opinion that the non-formation of gallic acid from Chinese gall-nuts, when treated in this way, is owing to the absence of any substance capable of acting as a ferment; and there certainly does not appear to be any other reason why the tannic acid which they contain, identical* in every respect with that of oak-galls, should not likewise yield gallic acid by this process.

If this conjecture be in accordance with fact, it would follow that the production of gallic acid from the tannic acid of Chinese gall-nuts might be effected by this process, on the addition of a small quantity of ordinary galls, perhaps also on the addition of yeast; and experiment proved that this is really the case.

A quantity of Chinese galls mixed with one-eighth of its weight of ordinary galls, both in powder, was made into a paste with water, and left exposed in an open vessel at the ordinary temperature. At the end of three weeks, during which time the water was frequently renewed as it evaporated, the mass had no longer any astringent taste, the filtered liquor gave but a slight precipi-

* Hitherto the identity of the tannic acid from these two sources has been inferred only from the correspondence of their physical and chemical characters; but Wittstein has found that the elementary composition is likewise the same. The tannic acid prepared from Chinese gall-nuts by extraction with ether in the ordinary manner, and dried at 130° F., gave, on combustion with oxide of copper alone, a quantity of hydrogen, which certainly agreed closely with the formula $C_{40}\ H_{36}\ O_{26}$ (=3.8 per cent.,) but the quantity of carbon was so small in proportion to that required by theory (=51.5 per cent.,) that he concluded it could not have been perfectly burnt; and on repeating the analysis, introducing some fragments of fused chlorate of potash into the posterior part of the tube, so as to obtain a supply of oxygen at the close of the operation, he obtained from 0.445 grm. of the acid, dried at 130° F., 0.164 grm. water, =0.01822 or 4.09 per cent. hydrogen, and 0.832 grm. carbonic acid, =0.2269 or 50.99 per cent. carbon.

tate with gelatine solution, and on boiling it a quantity of beautifully white gallic acid was obtained, amounting to nearly half the weight of the gall-nuts employed.

Another quantity of Chinese galls in powder was mixed with one-eighth of yeast and left exposed in the same manner. The production of gallic acid was rather slower than in the last experiment, the astringent matter not disappearing entirely until the end of four weeks and a half, but the quantity yielded was not smaller.

It follows, from these experiments, that the present theoretical view of the production of gallic acid from tannic acid is incorrect. Wittstein considers that the absence of any sweet taste in the digested mass is a sufficient proof that the sugar has been decomposed—the question is, in what manner?

Pelouze regards the change as a partial oxidation, assuming that tannic acid takes up eight equivalents of oxygen from the atmosphere, which, combining with four equiv. of carbon, escape and leave two equiv. of gallic acid. Adopting the old formula for tannic acid, $C_{18}\ H_8\ O_{12}$, this may be represented by the following equation:

$$\left.\begin{array}{r} C_{18}\ H_8\ O_{12} \\ O_8 \\ \hline C_{18}\ H_8\ O_{20} \end{array}\right\} = \left\{\begin{array}{ll} \text{2 equiv. gallic acid} & C_{14}\ H_8\ O_{12} \\ \text{4 equiv. carbonic acid} & C_4\ \ O_8 \\ & \hline & C_{18}\ H_8\ O_{20} \end{array}\right.$$

An evolution of carbonic acid certainly takes place, but Wittstein shows that it is in no way connected with the influence of atmospheric oxygen, for the production of gallic acid takes place when a paste of gall-nuts is allowed to remain a sufficient time in a flask with a bent tube dipping under water. He further states that he has obtained alcohol in this way, thus proving that the change consists in a vinous fermentation of the sugar existing in tannic acid, and that it is from this source the carbonic acid originates. Braconnot not long since observed, that powdered gall-nuts, moistened with water, suffered vinous fermentation; but this statement has not hitherto received the attention it deserved, because gall-nuts were found to contain no (free) sugar.

The author further expresses his opinion, that the absence of the necessary ferment, in sufficient quantity, is the only reason why an aqueous decoction of gall-nuts yield less gallic acid, and more

slowly, than when the gall-nuts are made into a paste with water, the ferment being probably insoluble.—*Pharm. Journ.*, March, 1853, from *Vierteljahresschrift für praktische Pharmacie*, Heft. i. 1853.

ON THE DETERMINATION OF WATER IN COMMERCIAL IODINE.

By M. Bolley.

Powdered iodine takes up a tolerably large quantity of water without experiencing any remarkable alteration in appearance. The quantity of water thus mechanically mixed with iodine may, according to some authorities, amount to as much as 10 or 12 per cent., and the methods for determining it are very insufficient. Although less volatile than water, this substance, like many others, is very readily carried off by the vapor of water. Chevallier recommends that the quantity of water should be determined by pressing a known weight of the iodine between folds of bibulous paper, and then weighing it again. It is evident that this method cannot furnish accurate results. Another method consists in rubbing the iodine with twice its weight of fused chloride of calcium, and heating the mixture to 356° F. in a tubulated retort, by which means the iodine is volatilized, while the water is retained by the chloride of calcium. In this case care must be taken that water is not evaporated from the chloride, and there is considerable trouble in thoroughly removing the iodine from the neck of the retort.

Bolley proposes the following method as being both simple and accurate. About 30 grs. of iodine are introduced into a small porcelain dish previously weighed, about 240 grms. of mercury added, and the whole weighed together with a small agate pestle. The dish is then laid upon a sheet of white paper, and the iodine and mercury rubbed together by means of the agate pestle until the smell of iodine has disappeared and the mass has assumed a reddish-brown color.* When complete combination has been effected,

* It suddenly becomes pasty, and closely resembles an amalgam, a fact which does not appear to have been noticed. To effect this, a quantity of mercury six or eight times as great as that of iodine appears necessary. The uncombined mercury may be pressed out from the iodine, which does not destroy the continuity of the former.

the dish is placed in a water-bath, and after some time weighed. The loss of weight gives the quantity of water in the iodine. There is a slight loss of water in this operation, in consequence of the heat developed during the combination of the iodine and mercury, but the quantity of iodine volatilized is very minute. It is advisable to lay a piece of starch-paper over the dish while in the water-bath, so as to be sure that no iodine has been lost in consequence of imperfect combination. The following results of the examination of three kinds of iodine will give some idea of the applicability of the process; two determinations were made in each case immediately after each other:—

Iodine	A. I.	3·79 p. c.	B. I.	4·05 p. c.	C. I. 6·31 p. c.
	II.	3·61 p. c.	II.	3·88 p. c.	II. 6·18 p. c.

—*Chem. Gazette*, March, 1853, from *Schweizerisches Gewerbeblatt*, Sept. 1852.

ON THE FABRICATION OF OIL OF ROSES IN THE BALKAN.

It is principally the Christian inhabitants of the low countries of the Balkan between Selimno and Carloya as far as Philippopolis, who occupy themselves with the culture of the *Rosa centifolia provincialis*. In good seasons about 400,000 meticals (1 metical = 1½ drachm) are obtained in this tract of country. 400 roses form about 1 oka, 8 okas furnish about 1 metical of oil. In bad seasons only from 100,000 to 200,000 meticals of oil are obtained. The process followed, contrary to so many statements, is simply a distillation of the roses with water; this is performed in copper retorts, which contain about 30 okas of water and the same quantity of roses. The oil obtained varies in its properties; many Kasas? furnish an oil which solidifies more readily than others. The former is more sought after in commerce, but the more fluid oil has the finer odor. The oil is put into copper vessels, called "kunkunnas," which contain 100—1000 meticals; these, when filled, are soldered up. The rose-water which is obtained at the same time serves as a cosmetic, &c. The transit of the oil of roses is from Kasanlik through Constantinople.—*Chem. Gazette*, March, 1853, from *Dingler's Polyt. Journ.*

ON THE ESTIMATION OF IODINE.

By Dr. Frederick Penny,
Professor of Chemistry, Andersonian University, Glasgow.

Among the many applications that may be made of bichromate of potash to the purposes of centigrade analysis, there is none more convenient or useful than its employment for the estimation of the amount of iodine in samples of commercial iodine and of iodide of potassium. In Glasgow especially, which is the principal focus of the manufacture of salts of potash, and of iodine from kelp, and where the problems referred to are frequently presented for solution, an expeditious and exact method for the determination of iodine becomes truly valuable.

According to the statements of a party well qualified to judge, it appears, that in the kelp season of 1851, the total quantity of kelp brought to Glasgow was about 6000 tons (22½ cwt. to the ton,) which may be considered a fair average of ordinary seasons. On account of the greatly increased demand for potash-salts, the arrivals in 1850 amounted to nearly 10,000 tons, which is considerably higher than for several previous years.* The manufacture, however, is not confined to Glasgow; there are iodine works at Borrowstowness, Greenock and Falkirk, in Scotland, at Ramelton in Ireland, and at Cherbourg and Brest in France.

The centigrade process, here to be described, for the estimation of iodine, is based upon the fact, that chromic acid in presence of hydrochloric acid causes the complete decomposition of soluble metallic iodides, the chloride of chromium and the chloride of the other metal being produced, while the iodine is thrown down in the solid state. Bichromate of potash is taken as the most convenient and stable form of chromic acid. The

* *Kelp Imports in Glasgow. July to July.*

1841–42	2565 tons.
1842–43	1887 "
1843–44	1965 "
1844–45	3263 "
1845–46	6086 "
1846–47	3627 "

Mr. Glassford's *Kelp Manufacture.*

reaction with iodide of potassium is exhibited in the following equation:

$$3KI+KO, 2CrO^3+7HCl = I^3+Cr^2 Cl^3+7HO.$$

The action is immediate, and provided that the solutions are kept cool, no secondary result is formed. The precipitated iodine speedily subsides, leaving the supernatant liquid quite clear, though slightly colored, with a few floating particles of iodine on the surface. When the solution of the bichromate is overdosed with the iodide, it becomes dark red, from a portion of the iodine being dissolved by the excess of the iodide. This change of color is useful as indicating when the addition of the iodide has been carried too far.*

ON THE ESTIMATION OF THE STRENGTH OF FRENCH ESSENCES.

By Mr. Thomas Jackson.

Wishing to estimate the comparative value of two samples of "*Extrait triple au Jasmin*" in a more positive and satisfactory manner than that founded on their specific gravities, or their odors, and having searched in vain through the works at my command for some acknowledged mode of operating, I took into consideration the possibility of isolating the essential principles present, modified by heat or by combination.

A preliminary experiment, performed with one drachm of essence added to two ounces of a strong solution of chloride of sodium slightly acidulated, exhibited on the surface of the liquid a film of essential oil, reddened by the free acid, after a night's repose. With the view of obtaining a similar but more complete result, I substituted chloride of calcium for common salt. Commercial chloride of calcium was dissolved in rectified spirit, and the solution filtered and evaporated to dryness. To half-an-ounce of essence, contained in a graduated tube, the dry chloride of calcium was added to saturation, then two drachms of water, or as much as was required to render the mixture sufficiently fluid for the essential oil to separate. The solution, previously to the addition of the water, was clear, but when the water was added it

* Those who may desire the details of this paper, are referred to the Chemical Gazette, vol. x. p. 392, from whence it is taken.—Ed. Am. Jour. Pharm.

became cloudy, and evidence of the separation of oil was soon manifested.

Under these circumstances the oil rises to the surface, and is found there in a flocculent mass after the mixture has stood for a few hours, or during a night; and the measure of the oils thus separated afford a fair index of the relative strength of the essences examined.

In order to get the oils in a more definite state, the mixture in which the separation had been effected was twice washed with an equal volume of ether, and the latter, after being decanted, was allowed to evaporate spontaneously. The sides of the evaporating dish were coated with a concrete oil of a light orange color, and at the bottom of the dish was a small quantity of fluid, which, on being dried over sulphuric acid, afforded crystals of chloride of calcium. By washing the contents of the dish with ether, which had been previously dried with chloride of calcium, and again evaporating the solution spontaneously, the essential oil was obtained free. It is a concrete oil, having a powerful and characteristic odor, and of a pale color. On the addition of oil of vitriol, it acquires a deep blood red color and a pungent odor.

The mother liquor, containing the chloride of calcium, from which the oil had been separated, on being afterwards evaporated afforded a very faint smell.

Two samples of essence examined in the manner described, gave, in round numbers, one grain and three grains respectively of essential oil from half-an-ounce of the essence.—*Pharm. Journ., Feb.*, 1853.

Manchester, Jan. 11th, 1853.

ON THE ALUM SPRINGS OF VIRGINIA.

By Dr. Thomas Pollard, of Richmond.

[We extract the following from an article in the Richmond, Virginia, Stethoscope for March, by Dr. Pollard, on the Alum Springs of Rockbridge and Bath counties of that State.]

The Rockbridge Alum Springs are situated 17 miles west of Lexington, and have rapidly grown in reputation and public favor. The springs issue from the base of a hill 100 feet in elevation, and are five in number. They flow from the rock and are supplied by the percolation of the rain water through strata of clay slate, which is the source of their mineral constituents. The springs

vary in the proportion of solid constituents, and the same spring is not uniform in composition, being affected by rains. The following analysis of spring No. 2 was made by Dr. Hayes of Boston, the quantity examined being one gallon:

Sulphate of potash - -	1.765 grs.
Sulphate of lime - -	3.263 "
Sulphate of magnesia -	1.763 "
Protoxide of iron - -	4.863 "
Alumina - - - -	17.905 "
Crenate of ammonia - -	0.700 "
Chloride of sodium - -	1.008 "
Silicic acid - - -	2.840 "
Free sulphuric acid -	15.224 "
Free carbonic acid. - -	7.536 "
	56.867 "
Pure water - -	58315.133 "
	58372.000 "

The diseases in which this water has most reputation are dyspepsia, scrofula, chronic diarrhœa and skin diseases.

The Bath Alum Springs are located about 17 miles west of the Rockbridge Springs, in Bath County. The springs are six in number, and issue at the base of a hill only 15 or 20 feet high, of slate formation. The following is Dr. Hayes' analysis of spring No. 3, viz:

Free sulphuric acid - -	7.878 grs.
Carbonic acid - - -	3.846 "
Sulphate of potash - -	0.258 "
Magnesia - - - -	1.282 "
Lime - - - -	2.539 "
Protoxide of iron - -	21.776 "
Alumina - - -	12.293 "
Crenate of ammonia - -	1.776 "
Silicate of soda - -	3.150 "
	54.798 "
Pure water - -	58317·202
	58372.000 "

This water is used for like purposes with the preceding, but is more chalybeate. The details of the therapeutic properties and application of these waters will be found in the *Stethoscope* for March, 1853, page 148–154.

Varieties.

Sketch of the Opium Trade, as carrried on between India and China. By NATHAN ALLEN, M, D., Lowell, Massachusetts.—Opium, as is well known, is the production of the plant *Papaver somniferum*, called in English the Poppy. This plant was originally a native of Persia, but is now found growing as an ornamental plant in gardens throughout the civilized world. It is most extensively cultivated in India, where it is estimated that more than 100,000 acres of the rich plains of that country are occupied for this purpose, giving employment to many thousands of men, women, and children. Its cultivation throughout is very simple. The seed is sown in November, and the juice is collected during a period of about six weeks in February and March. The falling of the flowers from the plant is the signal for making incisions, which is done in the cool of the evening, with hooked knives, in a circular manner, around the capsules. From these incisions a white milky juice exudes, which is concreted into a dark brown mass by the heat of the next day's sun; and this being scraped off every evening as the plant begins to exude, it constitutes opium in its crude state. India, it is said, produces sixty thousand chests of opium annually, each chest varying in weight from 125 to 140 pounds.

Two of the principal localities for the cultivation of this drug in Bengal are subject to the East India Company, and the manufacture and traffic in it is a strict monopoly of the government. In the others there is a most oppressive system of espionage established over the natives, to an extent which throws the control of the traffic into the hands of the same company. On that which was raised in Malwa, a province lying in the western part of India, beyond the East India Company's control, and which, in order to reach Bombay, the principal market, has to pass through certain territories of the Company, a *transit duty* of 400 rupees is levied. The income from this tax in 1846 was £1,000,000, which, with the revenue received the same year at Calcutta, from the article, makes the sum total of income to the Company from it £3,000,000.

The idea of sending opium from Bengal to China originated in 1767. From this time to 1794 the trade in it met with but poor success. In the latter year the English succeeded in stationing one of their ships laden

with opium at Whampoa, where for more than a year she lay unmolested, selling out her cargo. In 1821, owing to the difficulties attending the sale at these places, the opium merchants withdrew all their vessels from Whampoa and Macao, and stationed them under shelter of Lintin Island, in the bay, at the entrance of Canton river, which henceforth became the seat of extensive trade. From these vessels it was taken in Chinese junks and smugglers' boats, and retailed at various ports along the shore. In 1847, it is said about fifty vessels were engaged exclusively in this trade, besides a greater or less number which were only partially freighted with the drug.

It is stated that two and a half millions dollars worth of opium is annually imported into Foo-chow, from whence it finds its way into the interior. In that city alone there were, in 1848, one hundred houses devoted to the smoking of the drug, while as many retailed the poison in small quantities.

As respects the progress and present extent of the trade, it is said that from 1794 to 1820 the amount exported to China varied from 3,000 to 7,000 chests per year. In 1837 it amounted to between 39,000 and 40,000 chests, valued at $25,000,000. From 1838 to 1842 the trade was almost entirely interrupted by the war which grew out of the attempts on the part of the Chinese government to suppress it. At the conclusion of the war, the trade was resumed with renewed vigor. For the year 1848, the amount imported into China from Bombay was 19,111 chests, and from Calcutta 36,000 chests, which, at an average of $550 per chest, would amount to $32,000,000 expended for this single article of trade. Then the Chinese pay an advance on this sum of several millions more, which goes into the hands of the merchants as the fruit of their investment and labors in the trade.

The principal use made of opium by the Chinese is in the form of smoking, a practice to which they become most passionately addicted. The wealthier orders do their smoking in their own dwellings, but for the poorer classes there are thousands of shops fitted, in many of the Chinese cities, with accommodations expressly for smoking. Many of these shops are represented to be the most miserable and wretched places imaginable. Rev. Mr. Squire of the Church Missionary Society, says of them—"Never, perhaps, was there a nearer approach to hell upon earth than within the precincts of these vile hovels, where gambling is likewise carried on to a great extent." It is stated that there are one thousand of these opium shops in the city of Amoy. All classes in the community are addicted to the practice.

The effects of this drug upon the consumer are thus described by a distinguished Chinese scholar: "It exhausts the animal spirits, impedes the regular performance of business, wastes the flesh and blood, dissipates every kind of property, renders the person ill-favored, promotes obscenity, discloses secrets, violates the laws, attacks the vitals and destroys life." This statement is confirmed by other natives, and also by foreign residents;

and it is asserted that, as a general rule, a person does not live more than ten years after becoming addicted to the use of this drug.

The Chinese government have made strong efforts to cut off or restrict the traffic in this drug. Public attention was directed to its injurious effects in 1799, and in 1809 an edict was issued requiring all ships discharging their cargoes at Whampoa, to give bonds that they had no opium on board. Still more stringent laws were adopted in 1820. In 1834 an edict was issued, declaring that the injury done by the influx of opium, and by the increase of those who inhaled it, was nearly equal to a *general conflagration*, and denouncing upon the seller and smoker of the poison the bastinado, the wooden-collar imprisonment, banishment, confiscation of property, and even death by public decapitation or strangulation. But notwithstanding all this, the trade kept increasing, until at length an Imperial Commissioner was appointed, clothed with the highest authority, to proceed to Canton and endeavor to effect an utter annihilation of the trade. In carrying out this determination, he seized and destroyed some 20,280 chests of opium, and compelled the merchants to sign a bond that they would forever cease trading in the article.

This bold and decided measure on the part of the Commissioner led to the war with England, which is commonly known as the opium war, the result of which is well known to all our readers. The Chinese were defeated, and subjected to terms which reflected anything but honor upon their conquerors; one of which was the forcing of this traffic upon the Chinese—a traffic which they had always considered contraband and illegal, and had striven by every means in their power to annihilate and protect their people from. When urged to legalize the trade, the Emperor replied in these memorable words—"It is true," said he, "I cannot prevent the introduction of the flowing poison; gain-seeking and corrupt men will, for profit and sensuality, defeat my wishes; *but nothing will induce me to derive a revenue from the vice and misery of my people.*"

One result of the war was the ceding of the island of Hong Kong to the English. In this island, after passing into the hands of the victors, the trade in opium was legalized, and twenty shops for its sale immediately licensed, within gun shot of the Chinese Empire, where such an offence is punishable with death. Thus the war, instead of putting an end or check to the system, through the cupidity of the English, resulted in affording greater facilities than ever for its prosecution. The Chinese dare not impose the penalties affixed to a violation of their laws restricting the trade, which have never been abrogated or repealed, for fear that if they should do so it might be made the groundwork for another war, which would result in their being despoiled of still larger portions of their territory and possessions.

It is stated upon the highest authority, that the British government in India could not be sustained without the immense revenues derived from this trade. This revenue for the last six years, it is said, has amounted to nearly $80,000,000. It is also estimated that the immense sum of $400,000,000 of

specie has been drained from China to pay for this article alone, within the last half century. That this pernicious contraband traffic is upheld mainly by the British government, through its agent, the East India Company, all are aware; and the stain which its conduct towards the Chinese, in *forcing* this "flowing poison" upon them, is held up to the detestation of the civilized world. Money, not morality, has been its governing principle; and to increase its own resources and power, it has legalized and upheld this traffic, which is destroying, morally, socially, and politically, the whole Chinese nation; and which threatens to blot it out from among the nations of the earth. Well might we inquire, what must be the verdict of future generations, as they peruse the history of these wrongs and outrages? Will not the page of history which now records £20,000,000 as consecrated on the altar of humanity to emancipate 800,000 slaves, lose all its splendor and become positively odious, when it shall be known that this very money was obtained from the proceeds of a contraband traffic on the shores of a weak and defenceless heathen empire, at the sacrifice, too, of millions upon millions of lives?—*New York Med. Gaz.*

Mixtures or other Medicinal Preparations, containing Gum-resins—The gum-resins, such as myrrh, ammoniacum, assafœtida and others, may be successfully suspended in mixtures and other preparations by means of the following easy and simple process. On adding six or eight drops of pure sweet almond oil to a very small quantity of the gum-resin employed, it forms into a mass by trituration in a mortar; and when the oil and gum-resin have become thoroughly incorporated together, the result is a smooth paste, to which the vehicle, in which it is intended the gum-resin shall be administered, is to be added very gradually. By this means an emulsion is prepared in a very speedy manner. This method of preparing emulsions with the gum-resins admits of the mixture being heated, if necessary, without causing the least coagulation; whereas emulsions prepared by means of the yolk of egg will not allow of the application of heat, without more or less coagulating; an advantage of which both the pharmaceutist and the physician will on all occasions gladly avail themselves.—*Annals of Pharmacy and Practical Chemistry.*

Some remarks on Potash or Soft Soap. By Dr. G. C. Wittstein.—It is well known that soda soap will not dissolve in a solution of alkaline salts, and that the attempted separation of potash soap from its solution, by means of common salt or sulphate of soda, produces a soda soap by double decomposition; and therefore it is impossible, by the methods employed in the manufacture of soda soap, to make potash soap*.

From the great analogy which exists between soda and potash compounds, it would be expected that potash soap would be separated from its solutions

* For these reasons nearly all the potash soap sold at chemists, as being the article ordered by the London Pharmacopœia, is imperfectly prepared, containing soda, glycerine, &c.—*Editors of the "Annals."*

by potash salts. However, this is not the case, as when to a solution of potash soap, which has been obtained by boiling fats with a solution of caustic potash, a considerable quantity of chloride of potassium has been added, the separation of the soap does not follow; the salt dissolves in the soap, and the solution remains clear.

From this result it is evident that it is impossible, as in the ordinary process of making soda soap, to separate potash soap as such, by the aid of salts. The only way, therefore, to prepare potash soap from fats and caustic potash is to evaporate its solution to dryness, by which a sort of extract-like substance is obtained, containing glycerine and other impurities.

When a pure potash soap is required, it can only be made by the direct union of the oily acids with caustic potash, and not by the saponification of oils.*—*Annals of Pharmacy, Sept.* 1852.

Notice of the "Ice Spring" in the Rocky Mountains, (from a letter of Geo. Gibbs, Esq.)—The Ice Spring, so called, is considered by the mountaineers as one of the curiosities of the great trail from the States to Oregon and California. It is situated in a low marshy "swale" to the right of Sweet water river, and about forty miles from the South Pass. The ground is filled with springs, and about eighteen inches beneath the turf lies a smooth and horizontal sheet of ice, which remains the year round, protected by the soil and grass above it. At the time of our passing, July 12th, 1849, it was from two to four inches thick, but our guide told us that he had seen it a foot deep. It is perfectly clear, and beautifully disposed in hexagonal prisms, separating readily at the natural joints. The ice has a slightly saline taste, the ground about it, as with the Sweetwater and Platte river country generally, being impregnated with salts, and the water at one spot near by tasted of sulphur. Not the least singular circumstance was the smoothness of the upper surface of the stratum, although formed beneath soil.—*Silliman's Journal.*

Saccharated Medicinal Powders.—Some of the most useful of our pharmaceutical preparations are those known as tinctures, which hold in solution many of the most active principles of vegetable substances. Yet as alcohol, either pure or more or less diluted with water, constitutes the greater part of their composition, the frequent administration of this substance is,

*Dr. Wittstein is in error here, as a pure potash soap can be separated from its solutions and from glycerine, when made in the ordinary way, by a concentrated solution of caustic potash, in which it is insoluble. The best method to make the potash or soft soap of the London Pharmacopœia is to boil olive oil with a sufficient quantity of a solution of caustic potash until it is saponified; then to concentrate the solution by heat in a water-bath, and afterwards to add a strong solution of caustic potash to it, when the potash soap will float on the surface, if the solution be sufficiently strong, and may be removed. By placing the soap in a funnel, the excess of caustic alkali and glycerine will drain from it. By this method an excellent soap, of a clear, gelatinous appearance, is obtained.—*Editors of the "Annals."*

occasionally, very much open to serious objections, both on the part of the physician and his patients. For this reason Dr. Becker recommends the employment of saccharated medicinal powders as substitutes for tinctures, whenever the latter may be considered objectionable. He directs equal proportions of the tinctures of hellebore, cinchona, hyoscyamus, or of other vegetables, as the case may be, and sugar, to be well mixed together, and then evaporated so as to drive off the alcohol, and then to administer the residue instead of the tincture. To this residue he gives the name of helleborus saccharatus, hyoscyamus saccharatus, cinchona saccharata, &c. &c., according to the drug made use of.

This mode of preparation of medical substances has evidently attracted the attention of some of the medical authorities of our own country, for in reference to this subject the editor of one of the medical journals makes the following practical observation: "Supposing the unimpaired medical properties of the tinctures can be thus fixed in these powders (which is problematical), this mode of administration would prove a great boon to physician and patient. Not only is alcohol obviously mischievous in many cases wherein the active principles, of which it is the vehicle, are indicated; but in others in which such contra-indication is not so apparent, it has often proved a means of inducing a habit of dram drinking, which prevails even among respectable females to a far greater extent than is usually supposed.—*Annals of Pharmacy.*

Butyric Alcohol.—Among the chemical facts brought forward at the Academy the past month, we notice the discovery of butyric alcohol by M. Adolph Wurtz. This alcohol, $(C_8\ H_9)\ O,\ HO$, which has been detected by M. Wurtz in the caput mortuum of the oil of potatoes, so much studied by chemists, furnishes a new verification of the beautiful theory of alcohols of Dumas, in which several lacunes have been recently filled by the cerotine and melissine of Mr. Brodie, and by the caprylic alcohol which M. Bouis has derived from castor oil.—*Silliman's Journal.*

On Pagliari's Hæmostatic. By M. Sedillott.—M. Pagliari, a pharmacien at Rome, professes to have discovered a styptic liquor of great power; and several of the officers of the French army have testified to its efficacy. M. Sedillot has also, on several occasions, brought forward cases in corroboration; and in the present paper he adduces additional ones, in some of which considerable vessels, although not those of the first class, furnished the blood. He says that it has been objected, that compression is employed by means of bandages and charpie; but this is merely to prevent the coagula which form being removed from the mouths of the vessel; and it has only to be continued for twenty-four or forty-eight hours. So little plastic is human blood, that compression alone, unaided by styptics, would have to be so prolonged and forcible, that it would risk the formation of ulcers or gangrene in the parts to which it was applied.

M. Pagliari has now revealed the composition which is as follows: Eight ounces of tincture of benzoin, one pound of alum, and ten pounds of water are boiled together for six hours in a glazed earthen vessel, the vaporised water being constantly replaced by hot water, so as not to interrupt the ebullition, and the resinous mass kept stirred round. The fluid is then filtered, and kept in stoppered bottles. It is limpid, slightly styptic in taste, aromatic in odor, and the color of champagne. M. Hepp, of Strasburg, has substituted white resin for the benzoin. Every drop of this fluid poured into a glass containing human blood, produces an instantaneous magma; and by increasing the proportion of the styptic to the quantity of the blood, a dense, homogeneous, blackish mass results.

Many are the circumstances in which the surgeon may not be able to have recourse to the ligature, as in the case of friable arteries, secondary hæmorrhage from deep-seated, painful, or inflamed wounds, the impossibility of seizing the artery, or where the hæmorrhage results from numerous arterioles, which are too small or retracted, or from veins and capillary vessels. In all cases, in fact, where compression is now usually employed, without much benefit being expected to result from it, and often, indeed, proving useless or dangerous, this fluid seems indicated.—*Brit. Med. and Chir. Review*, Oct. 1852, from *Bull. de Ther.*, tom. xlii. p. 491—502.

On Matico in Diarrhœa. By M. Modoni.—M. Modoni states that he has employed this substance in about 120 cases, and usually with good and speedy effect, in various species of intestinal discharges, and especially in atonic diarrhœa. It is given at the Bologna Hospital in doses of from 18 grs. to ℥j. per diem, no inconvenience, save a little nausea or diarrhœa, ever being caused, and this being capable of removal, either by diminishing the dose or temporarily suspending the remedy. In the most favorable cases, an impression is made upon the disease by three or four doses; and it is quite relieved in from three to six days. The medicine should, however, be continued awhile longer in order to prevent relapse. In those diarrhœas which, owing to the existence of visceral changes, or in the presence of a general dyscrasis, the return of the diarrhœa is inevitable, the matico is still an invaluable remedy, owing to the rapidity of its astringent action, which enables us to suspend the exhausting discharges, and obtain time for the employment of any other means which the nature of the case may indicate.—*Brit. and For. Med. Chir. Review*, July 1852, from *Bulletino delle Scienze Med.*, vol. xx. p. 63.

On the Mode of Administration of Iodine. By M. Devergie.—M. Devergie administers the substance as an "antilymphatic," in the following manner: Porphyrized unoxidized iron filings, 40 centigrammes; iodine, 1 gramme, 65 to 80 centig.; water 8 grammes; simple syrup 500 grammes. The iron and iodine are triturated in a mortar, the water being added drop

by drop, and then incorporated with the syrup. When it is desired to add the iodide of potassium, 6 or 8 grammes are previously dissolved in the smallest possible quantity of water, and incorporated with the iron and iodine before the syrup is added. A tablespoonful of this syrup is given in a bitter tisane, (that of hops, prepared according to the Paris Codex, being the best,) night and morning.—*Ibid*, from *Gaz. des Hopitaux*, No. 22.

On the Medicinal Uses of Urate of Ammonia. By Dr. BAUER.—Five years' observation has convinced Dr. Bauer that this is a most valuable medicine in chronic cutaneous diseases and in tubercular diseases of the lung. An ointment containing one scruple to the ounce, is applied by a pencil to the eruption night and morning, the cure being effected in from one to three weeks. In tubercular disease the ointment is rubbed in alternately night and morning on the back and front of the chest. No inflammatory complication should be present during its employment.

In reference to this substance it is interesting to observe, that in Colombia, South America, where lepra prevails so extensively, the benefit derived from the internal and external use of *guano* has been placed beyond all doubt; and Dr. Lallemand has found it of great utility in the treatment of morphæ in the Brazils. The urate of ammonia, which is found in this substance in great abundance, is probably the chief medicinal agent.—*Ibid*, from *Buchner's Repert.*, No. 19, p. 86.

On the Deprivation of the Noxious Power of Poisonous Mushrooms.—By M. GERARD.—M. Gerard has recently exhibited before a committee of the Paris Council of Health, the complete innocuousness of the most poisonous species of mushroom, after being subjected to a very simple mode of preparation. The experiment was exhibited in his own person, after both he and all the members of his family had made similar trials with the like result. Two of the most poisonous forms were chosen: *amanita muscaria* and *venenosa*, of Pearson; and the trial was pronounced quite satisfactory. The preparation, principally consisting in suitable maceration, has, indeed, been long practiced to some extent by the country people. The researches of Letellier have also shown that the principle which he calls *amanitine*, is very deliquescent, and is remarkably and almost exclusively soluble in water. Alcohol only takes it up by reason of the small quantity of water which it contains; and when *amanitine* renders sulphuric ether yellow, this is owing to imperfect rectification. M. Gerard directs that to every 500 grammes of mushrooms cut up into a medium size, a litre of water, slightly acidulated by two or three spoonfuls of vinegar (or, if nothing else is at hand, gray salt,) should be added. If the water alone can be obtained, this must be renewed once or twice. In this fluid the fungi are to be macerated for two entire hours, after which they are to be washed in abundance of water. Next they are to

be put into cold water and boiled for half an hour, after which they may be taken out, washed, dried, and used as food.—*Ibid*, from *L'Union Medicale*, 1851, No. 148.

[M. Apoiger has recently shown (*Repertorium für die Pharmacie*,) that the poisonous principle of the toadstool may be separated by acetate of lead. By washing the precipitate and decomposing with sulphuretted hydrogen, filtering and distilling one half. The distillate smelled of the toadstool but was not poisonous. The residue in the retort evaporated to an extract, and, treated by ether, gave a crystalline crust by its evaporation, three grains of which killed a kitten in a few minutes. Buchner thinks it probable that the poison is an organic base in combination with boletic and fungic acids. (*Ann. of Pharm.*, April 1852.)—Ed. Amer. Jour. Pharm.]

A Pharmaceutical Society in Italy.—In Turin a Pharmaceutical Society has, at last, been established, with a staff of officials, consisting of a president, vice-president, general secretary, treasurer, censors, and two under secretaries. This is a wonderful progress for these oppressed but gifted people, whose rulers have heretofore even suppressed discussion on scientific subjects. In fact, it is related that so heartily do those creatures of kingcraft, the police, hate everything in the shape of freedom, and at the same time are so ignorant, that they once stopped a chemical work from passing the frontier, because one of these worthies, in his zeal, took the trouble of looking through the book and found in a passage describing some chemical decomposition, the words, "that iodine became free." Of course, nothing in Italy could be allowed to become free, not even iodine!—*London Annals of Pharm.*

Adulteration of Guaiacum Wood.—Huraut has found that guaiacum wood is mixed with the shavings of other woods. In order to detect the adulteration it is only necessary to take advantage of the behavior of guaiacum wood towards oxidizing agents. If the wood is treated with a solution of chloride of lime it assumes a green color within a few seconds, while other woods either retain their natural color or are rendered paler, but never become green.—*Ibid*, from *Journ. de Pharm. et de Chim.*

On the presence of Amygdalin in various plants.—Wicke has continued his previous investigations on this subject. He submitted the various buds and bark of Sorbis aucuparia, S. hybrida, Amelanchier vulgaris, Cotoneaster vulgaris, and Prunus padus to distillation, and tested the distillate for hydrocyanic acid. This was done in the autumn in order to determine whether amygdalin was not formed until the process of vegetation commenced, or was stored up in the plant during the autumn. The results which he obtained were in favor of the latter view, and in this respect amygdalin behaves in a manner analogous to starch, with which it has the further peculiarity in common that it decreases in quantity during the period of growth. It would also appear as if the amygdalin of the amygdalaceæ and pomaceæ

took some share in the formation of cells, a conjecture which is supported by the circumstance that the amygdalin in plants belonging to the two groups is chiefly contained in the fruit kernels. On comparing the small quantity of buds which were employed for the experiments in the autumn with the far larger quantity of young shoots to which his previous communication referred, and estimating the quantities of hydrocyanic acid contained in the distillates in each case, the above conjecture becomes almost a certainty. The bark and buds of Prunus padus contain a much larger quantity of ethereal oil in the autumn than was found in his previous examination.—*Ibid*, from *Ann. der Chim. und Pharm.*

Adulteration of Arnica Leaves.—ZÖLFFEL states that he received from a drug dealer, under the name of Arniça, leaves which were altogether different from those of this plant. They were palmated, with five lobes, incised at the apices, and serrated, the teeth being ciliated. On closer examination they proved to be the leaves of *Astrantia major.*—*London Pharm. Journ.* from *Archiv. der Pharmacie.*

Permanganate of Potass.—This salt has lately been recommended in some forms of urinary disease, and it is probable that it possesses medicinal properties that demand a fuller investigation. The dose of the permanganate of potass is from one to three grains in solution, with three or four tablespoonfuls of water. This dose may be given three times a day, shortly before meals. A London medical practitioner, Mr. Sampson, has published in the *Lancet*, an account of its successful employment in diabetes.—*London Ann. of Pharm.*

Boracic Acid.—A new source of this important substance has recently been discovered in South America; beds of native borate of lime having been found in Iquigne, in the vicinity of the deposits of nitrate of soda. The borate appears to exist in considerable quantity, associated with beautifully crystallized glauberite, or native sulphate of soda, similar to the well known salt which occurs in the neighborhood of Madrid. The first shipment of the borate was recently sold at Liverpool, at 60s. a cwt.—*Ibid*, from *Journ. of the Society of Arts.*

Statistics of the Philadelphia Gas Works.—The following Statistics are selected from an article in the Franklin Institute Journal, noticing the 18th annual Report of Mr. Cresson the Engineer.

The total amount of coal used in the retorts was 680,792 bushels, which yielded 216,216,000 cubic feet of gas, and 855,512 bushels of coke. On an average therefore a bushel of coal yielded 316.13 cubic feet of gas, and 1.26 bushels of coke.

The total length of the street main pipes now laid, (in the City proper,) varying from 2 to 20 inches in diameter, is 144 miles.

The Philadelphia Gas Works is the largest, and was one of the first establishments of the kind in the United States; and the price of gas is

lower than from any other works in the Union, being but $1.90 per thousand to customers making prompt payment. Its growth has been so rapid as to render necessary a removal of the manufacturing department, owing to want of space in its present position. The gasometers, however, will remain at the old place; they are eleven in number, and of the following sizes; eight single, 50 feet diameter, 20 feet high; two telescopic, 80 feet by 40 feet; and one telescopic, 140 feet diameter, and 70 feet high, which last is still the largest in the world. At the new works the trustees are erecting a grand distributor, 160 feet diameter by 96 feet, telescopic, which will hold nearly two millions cubic feet. The average daily consumption during the past year has been about 600,000; the maximum consumption for 24 hours was 1,123,000 cubic feet.—*Journ. Frank. Inst.*

PHILADELPHIA COLLEGE OF PHARMACY.

COMMENCEMENT—1853.

The Annual Commencement of the College was held on Thursday evening, March 31st, at half past seven o'clock, in the Musical Fund Hall.

Prof. Procter having briefly stated the character of the Institution and the object of the occasion, the Degree of Graduate in Pharmacy was conferred, on behalf of the Board of Trustees, by its Presiding Officer, Dr. John Harris, on the following gentlemen:

Graduating Class.		*Subject of Thesis.*
Bachman, Alexander,	Penna.	Tannic and Gallic Acids.
Bonsall, Charles T.	N. Jersey	Stearoptene of Oil of Monarda, &c.
Cheston, Elijah, Jr.	Penna.	Arctium Lappa.
Davis, John W.	Penna.	Sanguinaria Canadensis.
Faunce, John H.	Penna.	Camphor.
Gutekunst, Frederick,	Penna.	History of Metallurgy, &c.
Harres, J. Henry,	Penna.	Salix.
Ogden, Edward H.	Penna.	Asclepias Tuberosa.
Pollard, Oscar,	Penna.	Cannabis Indica.
Pyle, J. Lindley,	Penna.	Rhus Radicans.
Robinson, Edward T.	Virginia.	Syrupus Ferri Iodidi, &c.
Savery, William, Jr.	Penna.	Rumex Crispus.
Sheaff, John F.	Penna.	Coptis Trifolia.
Shrom, Charles F.	Penna.	Prinos Verticillatus.
Southall, Turner H.	Virginia.	Analysis of California Cinnabar.
Stevens, Hennell,	Penna.	Glycerine.
Watson, William J.	Penna.	Rhus Glabrum.

The Valedictory Address was delivered by Prof. Robert Bridges.

The exercises of the occasion were attended with music from the Orchestra under the direction of Mr. B. C. Cross.

Alfred B. Taylor,
Secretary of Board of Trustees.

Minutes of the College.

At a stated meeting of the Philadelphia College of Pharmacy, held Third Month 29th, 1853. Vice President Charles Ellis in the Chair. The minutes of the last stated meeting were read and approved. The minutes of the Board of Trustees were then read, by which the College is informed that Thomas H. Montgomery, Bradford Ritter and Henry M. Troth, graduates of the College, were elected members by the Board of Trustees.

It also learns that the Examining Committee and Professors of the Philadelphia College of Pharmacy, having reported that each of the following named Candidates had presented a Thesis and certificate of character and apprenticeship, had passed a satisfactory examination, and were recommended as worthy of the Degree of Graduate in Pharmacy, that honorary distinction was conferred on them by the Board of Trustees:

Alexander Bachman,	Edward T. Robinson,	Frederick Gutekunst,
Elijah Cheston, Jr.,	John F. Sheaf,	Edward H. Ogden,
John H. Faunce,	Turner H. Southall,	Lindley J. Pyle,
J. Henry Harres,	Charles T. Bonsall,	William Savery, Jr.,
Oscar Pollard.	John W. Davis,	Charles F. Shrom,
	Hennell Stevens,	William J. Watson.

The Delegates appointed at the last annual meeting to attend the National Pharmaceutical Convention, reported as follows:

To the Philadelphia College of Pharmacy.

The Delegates appointed at the last annual meeting respectfully report, that the Convention was held in Philadelphia, and at the Hall of this College, in accordance with an invitation extended by the Board of Trustees, through the *Journal*, and they herewith present a printed copy of its proceedings. By the statements and documents therein contained, it will be perceived that the Convention resolved itself into a permanent body, to meet annually, assumed the title of "The American Pharmaceutical Association," and adopted a Constitution and Code of Ethics, copies of which are appended to the proceedings.

Several subjects engaged the deliberation of the Convention, the principal of which were the *Drug Law* and its working—the Sale of Poisons—the subject of Secret Medicines—and Pharmaceutical Education and Organization.

An Article of the Constitution declares that "every local Pharmaceutical Association is entitled to send five delegates to the annual meetings"

In accordance with this clause, it will be necessary for the College to appoint five delegates to attend the meeting of the Association to be held at

Boston, on the 24th of August next, to act as their Representatives at the meeting.

CHARLES ELLIS,
W. PROCTER, JR., } On behalf of the Delegation.

Philadelphia, 3d mo, 1853.

The following Report of the Publishing Committee, accompanied by a statement of the financial condition of the *Journal*, was read and accepted:

To the Philadelphia College of Pharmacy.

The Publishing Committee respectfully report, that since their last communication the *Journal* has been regularly issued. In accordance with the hints contained in the Report to the last annual meeting, the committee have deemed it advisable, after careful consideration, to enlarge the size of the volume by increasing the frequency of issue to six times a year, preserving the size of the numbers at 96 pages as heretofore. By this arrangement, the subscribers receive the *Journal* on the first of every alternate month, commencing with January, and have 576 pages, instead of 384, advantages which many of them have not failed to appreciate.

The number of copies printed has been increased one-third. To partially meet the greatly-increased expenditure occasioned by these changes, the Committee have fixed the price at three dollars per annum, or five dollars for two years in advance, a charge which has been cordially met by a large number of the subscribers.

The variety of matter embraced in the *Journal* continues unabated, and the disposition to support the work, in a scientific point of view, has not retrograded, although the number of original communications is smaller than it should be, in view of the many pharmaceutists who are capable of making observations worthy of record.

The annexed exhibit of the Treasurer shows the state of the finances to be healthy; yet the Committee believe that until the experiment now in course be fully tried, the funds of the Committee should not be drawn on in favor of the sinking fund committee.

CHARLES ELLIS, A. B. TAYLOR,
PROF. BRIDGES, E. PARRISH,
March 28th, 1853. W. PROCTER, JR.

At last Report there was a balance in the hands of the Committee, of	$620.20
Receipts through the year, ...	1032.42
	$1652.62
To expenses of printing, editing, collecting, &c., :	1166.70
Leaving balance in hands of Committee, . .	$485.92

The Committee on Latin Labels made a satisfactory Report, which was accepted.

On motion of Professor Procter, the following Resolution was adopted:

Resolved, That this College approves of the objects and proceedings of the National Pharmaceutical Convention, held in Philadelphia, October, 1852, and cordially tenders its support to the American Pharmaceutical Association.

The College proceeded to the annual election of officers, and also for five delegates to the next meeting of the Association, to be held at Boston. After a recess, the Tellers reported that the following members had re-

ceived a majority of votes, and they were accordingly declared duly elected to the respective offices:

President, Daniel B. Smith,
Vice Presidents, Charles Ellis and Samuel F. Troth,
Secretary, Dillwyn Parrish,
Treasurer, Ambrose Smith,
Corresponding Sec., Joseph C. Turnpenny.

Publishing Committee,

Charles Ellis, Prof. Robert Bridges, Edward Parrish,
Alfred B. Taylor, William Procter, Jr.

Trustees,

Warder Morris, Edward Parrish, William Procter, Jr.,
Robert Bridges, Daniel S. Jones, John H. Ecky,
William P. Troth, Caleb H. Needles.

Committee on Sinking Fund,

Warder Morris, Samuel F. Troth, Ambrose Smith.

Delegates to the American Pharmaceutical Association.

Daniel B. Smith, William Procter, Jr., Charles Ellis,
Alfred B. Taylor, Charles Bullock.

On motion it was ordered that the Delegates to the Association be authorized to fill any vacancies which may occur in their body.

It was ordered that the College proceed to the election of Honorary Members, which was deferred from the last stated meeting, and, on motion, the rule requiring an election by ballot was suspended, and the College proceeded to elect the candidates *viva voce*. Since the last meeting of the College, Dr. Jonathan Pereira, whose name was at that time proposed, has deceased. The question being taken, the following gentlemen were declared duly elected, and the Corresponding Secretary was requested to furnish certificates of honorary membership, accompanied by a suitable letter, to each:

Theophilus Redwood, London,
Jacob Bell, do.
Sir Wm. J. Hooker, do.
Thomas Graham, do.
William Gregory, M. D., Edinburg,
Asa Gray, Cambridge, Mass.,
William Darlington, M. D., West Chester, Pa.,
R. Donovan, Dublin, Ireland,
Sir R. Kane, do. do.
Leopold Gmelin, Heidelburg, Germany,
E. Soubeiran, Paris,
E. Dumas, do.
C. Gerhardt, do.
M. Regnault, do.
Justus Leibig, Munich, Bavaria.

The following communication from the Executive Committee of the Pharmaceutical Association was read, and referred to the Board of Trustees for further action:

To the Philadelphia College of Pharmacy.

The Executive Committee appointed by the late Pharmaceutical Convention, respectfully present the following resolution and queries for your consideration and action, viz:

Resolved, That the Executive Committee be requested to obtain, through the several colleges of pharmacy and pharmaceutical associations, previous to our next annual meeting, answers to the following questions, as far as expedient:

1st. How many apothecaries and druggists are there in each of the principal cities and towns of the United States?

2d. What organizations exist in the several States, and what is the number of their members as compared with the number of druggists and apothecaries in the localities which they include?

3d. How far is the business of dispensing medicines separated from the office of prescribing?

4th. Have you any information in reference to the practice of our art, and the professional character of its practitioners, in different localities, likely to be of advantage to the Association in promoting the objects it has in view?

5th. Are there any State laws for the protection of the interests of the profession of pharmacy, for the suppressing of empyricism, or in reference to the sale of poisons?

On behalf of the Executive Committee,

Philadelphia, March 28th, 1853. WILLIAM PROCTER, JR., Chairman.

The College then adjourned. DILLWYN PARRISH, Secretary.

NOTICE.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The annual meeting of the American Pharmaceutical Association will be held at Boston on the 24th of August, 1853. The object of the Association being the advancement of Pharmacy in the United States, it is desirable that a general interest in its favor should be created among the pharmaceutists and druggists. According to the requirement of the Constitution, the following conditions of membership are published, and an invitation is hereby extended to all who are eligible to membership and who feel an interest in the Association, to attend the ensuing meeting.

"SECTION 2d, *Article 1st.*—All pharmaceutists who shall have attained the age of 21 years, whose character, morally and professionally, is fair, and who, after duly considering the obligations of the Constitution and Code of Ethics of this Association, are willing to subscribe to them, are eligible for membership.

"*Article 2d.*—The members shall consist of Delegates from regularly constituted Colleges of Pharmacy and Pharmaceutical Societies, who shall present properly authorized credentials, and of other reputable pharmaceutists, feeling an interest in the objects of the Association, who may not be so delegated, the latter being required to present a certificate signed by a majority of the delegates from places whence they come. If no such delegates are present at the meeting, they may, on obtaining the certificate of any three members of the Association, be admitted, provided they are introduced by the Committee on Credentials."

"*Article 5th.*—Every local Pharmaceutical Association is entitled to send five delegates."

Philadelphia, 4th mo. 11th, 1853. DANIEL B. SMITH, President.

Editorial Department.

THE AMERICAN PHARMACEUTICAL ASSOCIATION.—The period when this body will convene is rapidly approaching. In accordance with the Constitution, the President is required to publish a *call* at least three months prior to the time of meeting, and we invite attention to the preceding document issuing from that officer.

It is much to be desired that the next meeting of the Association should be full and interesting. The arduous labors of organization having been accomplished, the coming session should be devoted to consolidating the Association, and to measures calculated to promote the interest of Pharmacy throughout the country. Members will come to the meeting with a clearer view of the labor before them, and new members prepared to take part at once in the business. There *is* no need of the question "What is to be done?" but there *is* need to know "how is it to be done?" First, we want a great, uniting, harmonizing, liberalizing and enlightening influence to enter the profession; to soften prejudices, to moderate or subdue jealousies, to liberalize competition, to spread knowledge broad-cast, to excite ambition after excellence, and to call forth and encourage a feeling of brotherhood among pharmaceutists. Speaking for the entire body who dispens medicines in the United States, we need to be more sensible of our ignorance of what constitutes a true pharmaceutist; we lack a desire to excel in our calling for the sake of the profession; we require a more liberal basis in our intercourse with each other, by which unity of action may protect us from the many evils flowing out of an excessive competition, and we need the moral courage and energy that will rid the professional boundaries of the incubus of quackery and charlatanry. Further, the public need to be enlightened, also. The people, in the long run, will adopt the rational side of a question, if they examine both. They need to be awakened to the advantages arising from a better class of dispensers of medicines—who are governed by principle and conscience as well as by interest—who will refuse to sell them bad drugs when tempted by competition—and who will decline to furnish them with quackery, and will give them a sufficient reason for so doing. The position of apothecaries and druggists in the United States, as regards quack medicines, is a peculiar one. The circumstances of a sparsely settled country, where physicians and apothecaries are thinly scattered, by throwing the people on their own resources, has been one of the most powerful causes of the origin and growth of that almost universal disposition to seek the aid of this class of medicines, which *boldly promise* to supercede the necessity of both physician and apothecary, until now the whole community is tainted, from the most educated members of the legal and clerical professions, down through the mercantile, manufac-

turing and agricultural classes to the isolated dweller of the distant prairies of the West. This inclination to resort to secret medicines, is stimulated through every available medium, by those pecuniarily interested, in such bold and undoubting language, and in every form of testimony their ingenuity can invent, that the alleged efficacy of the medicines seems more probable than that such positive testimonials should be based on a tissue of falsehood and deceit. Quacks know the influence which the names of druggists and pharmaceutists lend in their favor, and hence they seek them for agents, and extensively circulate their lists of agencies. Under these circumstances, is it to be wondered at that quackery is intimately interwoven with the pharmacy of the United States? Is it surprising that the temptation to gain should not only induce us to supply the demand thus unrighteously created, by acting as agents for the quack, but in too numerous instances, influenced by their rapid accumulation of wealth, to plunge partially or wholly into the defiling current, and assume the livery of unblushing empyricism? It is against this seductive influence that we are to be induced to exert ourselves; it is with this double-headed monster, enrobed in such deceitful and enticing garments as to disarm our sense of insecurity, that we are to do battle, if we hope to elevate our profession to the position it should occupy in the scale of useful scientific arts. Alone, we can do but little. It is an old saying, "in union there is strength." But the combination of integral weakness and impotency never produced power; the hemp-fibre must have its native toughness unimpaired to produce the strong cable. The individuals of a nation must possess virtue to afford a strong government. So, in pharmaceutical reform, there must be, individually, a sincere desire to be free from existing abuses, accompanied by a determination equal to the attendant sacrifice, before any effort against the evils that beset our profession,—only one of which has been depicted,—can be ameliorated or removed.

We believe there exists among the apothecaries and druggists of this country many men equal to the occasion. Let us hope that they will meet in the American Pharmaceutical Association, and, gathering strength by union, effect something toward the desired reformation.

Drug Thieves.—We give place to the following communication, to put our city brethren on their guard against accidentally and unintentionally countenancing a form of villainy, that is not new to our city. Several years ago, a drug house suffered severely in the same manner, and it is certainly the duty of every apothecary to avoid purchasing drugs under circumstances leading to suspicion of the honesty of the party offering them, and to assist in detecting the guilty.

To the Editor of The American Journal of Pharmacy.

Considerable losses have been sustained from time to time by the trade, through the dishonesty of persons employed in various establishments. The police reports, a few days since, chronicle a series of thefts from a wholesale Druggist of this city, which, it appears, has been carried on for a long time; the value of the property taken is ascertained to be about two thousand dol-

lars. Opium, Indigo, and Hydriodate of Potash, were the favorite articles, while Prussian Blue, Liquorice, Cochineal, Gum Arabic, and other articles were stolen in more limited quantities. The object in calling attention to the subject in this article is, to express in the strongest terms of disapprobation, a conviction of the impropriety of dealers buying articles from unknown persons, or those not legitimately engaged in the business. The presumption is, that, in ninety-nine cases in the hundred, goods so offered are dishonestly obtained, especially when the persons are willing to take less than the market price.

"The receiver is as bad as the thief," and in some instances may be worse. Certain it is that the purchasers in making a market for the thief, furnish an inducement for him to steal. If thieves and their accomplices could find nobody willing to buy, it would be the most effective means of protecting the community.

Persons buying goods under the circumstances that have been alluded to, justly forfeit the confidence of honorable men. The names of quite a number of individuals, hitherto of good standing, to whom the goods stolen from D. L. Miller, Jr., can be distinctly traced as having been sold, are known. That some have purchased thoughtlessly there can be no doubt; such should make immediate restitution to the owner. The resolution to abstain wholly from such purchases hereafter, would be strengthened by the recollection of a previous loss. There are few things much more mortifying than to have one's name appear in the details of the trial of such cases of theft, as purchasers of articles from colored laborers, foreign grocers and tavern-keepers, or unknown street-hawkers. In this predicament, it is not improbable that some persons may find themselves, who, by failing to make restitution, leave the presumption that they are willing to profit by such depredations.

A.

National Scientific Exploratory Expeditions.—It is gratifying to observe the increasing disposition in our Government to send exploring expeditions to South America, Africa, and the great West, to develope the commercial or national resources of those countries, and open new fields for the merchant and the emigrant. The immense importance of attaching Scientific Corps to these parties should not be overlooked. Of the several departments of Natural History none have so strong an influence on medicine and pharmacy as Botany, and it is very desirable that the botanical gentlemen who may accompany these voyages should be able and disposed to profit by the crude, but often useful remedies, that aboriginal sagacity may have discovered in the forests and fields of the countries visited, and to bring with them abundant specimens for experiment at home.

Tully's Materia Medica.—We have received the fourth number of this work, for February. "The means of ascertaining the powers of new and previously unknown articles," are continued, through their natural history affinities, sensible properties and chemical composition, &c. We will defer a notice of its contents at present.

Our Exchanges.—It may be well to state for the information of some of our Exchanges who are in the habit of publishing the names of the Editors

of the Journals they receive, that neither Dr. Carson, Dr. Parrish, nor Dr. Procter, has charge of the Editorial department of this Journal, but simply William Procter, Jr., and that by crediting accordingly they may save those gentlemen, as well as the Editor, some trouble at the Post Office.

Massachusetts College of Pharmacy.—We extract the following statement regarding the above institution from the Boston Medical and Surgical Journal for March 16th, 1853:

"At the Annual Meeting of the Massachusetts College of Pharmacy, held at the rooms of the College in Masonic Temple, on Monday, March 9th, the following members were elected the officers for the ensuing year.

"*President*, Daniel Henchman. 1st *Vice President*, Thomas Restieaux. 2d *Vice President*, Samuel M. Colcord. *Corresponding Secretary*, William A. Brewer. *Recording Secretary*, Henry W. Lincoln. *Treasurer*, Samuel N. Brewer. *Auditor*, Joseph Burnett. *Trustees*, Thomas Farrington, Ashbel Boyden, Henry D. Fowle, Andrew Geyer, Joseph T. Brown, Samuel R. Philbrick, T. Larken Turner, William Brown.

Henry W. Lincoln, *Secretary*.

Hand-Books of Natural Philosophy and Astronomy. By Dionysius Lardner, D. C. L., &c. *Second Course.* Heat—Magnetism—Common Electricity—Voltaic Electricity. *Illustrated by upwards of* 200 *Engravings on Wood.* Philadelphia. Blanchard & Lea, 1853. pp. 451, 12mo.

These works are written with a view to simplify and render practical the import truths of physical science, without, at the same time, omitting those details in the absence of which they would convey but a smattering of the subject; and will very much facilitate their comprehension and acquisition by those readers who seek in physics a collateral aid in the prosecution of their professional or general studies.

The first part of the present volume is devoted to Heat, the laws of which are very thoroughly elucidated, and applied to ordinary phenomena. As regards Pharmacy, it is not too much to say that the principles set forth in this part of the book have a bearing and influence of the very first importance. The most valuable and indispensable processes of the apothecary's art are based on these laws, and it is only when the operator is acquainted with them that he can conduct operations in the most enlightened and eligible manner. The second portion of the book is devoted to Magnetism and Electricity, and includes notices of electro-metallurgy and electro-telegraphy. The principles and construction of galvanic apparatus are extensively treated of and illustrated. The conspicuous position occupied by Electrical Science, since the wonderful developments that have grown out of Galvani's experiments, is due to the vast influence these discoveries have had on general science, and the arts that administer to the comfort and pleasure of man. The connection between electricity and meteorological phenomena, and its influence on climate, is interesting to every man who is accustomed to ask the cause of those changes which daily affect his comfort, and even to such is the volume before us possessed of deep instruction. It is little

to say, then, that this work is well worthy a place on the book shelf of the student of pharmacy, and in the library of the seeker after general knowledge.

Elements of Health and principles of Female Hygiene. By E. J. Tilt, M. D., Senior Physician to the Farringdon General Dispensary, &c. Philadelphia: Lindsay & Blakiston, 1853. pp. 436, 12mo.

This book, which is intended for the general reader and more especially for parents and women, belongs to the class of which Comb's Physiology is a type, and is calculated to be of essential service to those to whom it is addressed. Commencing with infancy, the hygienic treatment of children best calculated to develop their organic systems, and through these to reach their moral and intellectual natures, is pointed out. About two-thirds of the book is especially devoted to the physical education of girls and women, and the subject is treated in a manner so thorough and rational that it will, if attended to, not only guide the reader clear of many a Scylla and Charybdis in her own progress through organic life, but will enable her to be an intelligent agent of the physician in administering to the sufferings of infancy and childhood, and to understand those manifestations which instinctively foreshadow the approach to womanhood, and the neglect of which entails such lasting and melancholy results on so large a number of her sisters.

Report from the Select Committee on the Pharmacy Bill, together with the Proceedings of the Committee, Minutes of Evidence and Index. Ordered by the House of Commons to be printed, May 21, 1852. pp. 245, folio.

We have received this interesting parliamentary document from Jacob Bell, Esq., Chairman of the Committee, and have been much interested in looking over the testimony, that the ample powers of the Committee enabled them to elicit from some of the most distinguished physicians, apothecaries, and pharmaceutical chemists of England. The "Bill" was "for Regulating the qualifications of pharmaceutical chemists," and subsequently passed both Houses of Parliament and became a law, but in a form much modified from the original draft. We propose to take an early opportunity to notice the character of this Act, which grants certain powers to the Pharmaceutical Society, and will then give some extracts from the testimony given before the Committee.

The Principles of Botany as Exemplified in the Cryptogamia. By Harland Coultas. Philadelphia; Lindsay & Blakiston.

This little volume is intended by the author as an introduction to the study of the simplest or least highly organized plants—those which are usually called flowerless, including mosses, ferns and lichens. The book is apparently the first of a series on structural botany, and the author diverges

from the ordinary pathway of botanical instructors in treating of this division of plants first. The book is neatly got up, and, at this season, when botanical pursuits are opening to the student, it appropriately appeals to him for an examination.

Notice of the late Dr. Jonathan Pereira.—Dr. Pereira was born on the 22d of May, 1804, in the parish of Shoreditch, London. His father was a London merchant, in moderate circumstances. Young Pereira was placed in a classical school when ten years old, and at fifteen was articled to a surgeon, but his employer becoming deranged, his indentures were cancelled, and he became a student at the Aldergate General Dispensary in 1821, and attended the Lectures of Clutterbuck, Birkbeck and Lambe. Early in 1823 he became a candidate for the office of Apothecary at the Dispensary, and was fortunate in obtaining it, at 19 years of age. Whilst in this position he established a class of pupils, whom he privately instructed with great success, and also published several small works for their use, among which the *Selecta e Præscriptis* passed through 11 editions. In June, 1825, he became a member of the College of Surgeons, and in 1826 succeeded Dr. Clutterbuck as Lecturer on Chemistry at the Aldergate Dispensary. Having acquired the German and French languages, he commenced a systematic and thorough study of Materia Medica, which led him to form the idea of his great work, and to the accomplishment of which he brought the most indefatigable industry, often working sixteen hours a day. In 1828 he commenced lecturing on Materia Medica, and soon had the largest class in London. Early in 1832 he resigned his office at the Dispensary, and in the following September married and established himself in general practice. In the winter of 1832 he became Professor of Materia Medica at the New Aldergate School, and at the same time succeeded Dr. Gordon as lecturer on Chemistry at the London Hospital. In 1835–6–7 he published his lectures on Materia Medica in the Medical Gazette, and greatly added to his reputation both abroad and at home. Meanwhile, he had been diligently pursuing his researches, and in 1839 published the first volume of his *Elements of Materia Medica*, the second volume appearing in 1840, and a new edition in 1842.

In 1840 Pereira became a Licentiate of the College of Physicians, having in the previous year been appointed Examiner in Materia Medica at the London University. In 1842, after the establishment of the School of Pharmacy by the Pharmaceutical Society, Dr. Pereira delivered several lectures before the members, and in the fall of 1843 became the Professor of Materia Medica to the Pharmaceutical Society, and delivered the first complete course on the subject that had been delivered to British Pharmaceutists. Here, adapting his subject to the wants of his listeners, he delivered, during a series of years, an annual course of lectures of the most thorough and interesting character. His connection with the Pharmaceutical Society was mutually fortunate; to himself by bringing the large re-

sources of the Society to bear on his favorite subject, and to them as the unrivalled teacher and writer on Materia Medica. His connection with the Society continued unbroken till the session 1851–52.

In 1845 Dr. Pereira was elected a Fellow of the Royal College of Physicians, and almost immediately afterwards became a member of the Pharmacopœia Committee, in which position he is believed to have rendered important service, and was curator to the museum at his decease. On resigning his Professorship at the London Hospital, in 1850, he transferred his most important specimens of Materia Medica to the Museum of the Pharmaceutical Society, and they are now its property.

In descending a stair case in the Hunterian Museum, he fell and ruptured the rectus femoris muscles of both legs, which confined him to his chamber for several weeks, but he was able to attend to his correspondence, and was moved about on an easy chair, when, about 10 o'clock on the evening of January 20th, he was suddenly carried off by an internal injury resulting from his fall, in the 49th year of his age, in the prime of his intellectual power.

Dr. Pereira's mind was characterized by an untiring perseverance in the pursuit of knowledge, which would not be satisfied until he had probed a subject to the bottom. No expense of time or money was spared to compass his pursuit of scientific truth, and in furtherance of his favorite study he kept up an extensive correspondence with all parts of the globe. His numerous papers in the Pharmaceutical Journal testify to his industry. The third edition of his great work, though not completed, was nearly so, and will be brought out under able superintendence, and will continue a lasting monument to his science and perseverance.

Death of Dr. Horner.—Prof. W. E. Horner, of the University of Pennsylvania, died in this city on the 13th of March, in the 60th year of his age. Dr. Horner graduated at the University in 1814, after service in the Late War as Surgeon; became adjunct Professor of Anatomy in the University in 1820, and succeeded Dr. Physick in 1831, in which position he continued until his death, which occurred from an organic disease of the heart which had seriously affected him for some years. An able teacher, and a thorough anatomist, Dr. Horner has departed in the midst of his honors, unstained in reputation and lamented by his numerous friends.